# LONGEVITY

*THE MEANS OF PROLONGING LIFE AFTER MIDDLE AGE*

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# LONGEVITY:

## *THE MEANS OF PROLONGING LIFE AFTER MIDDLE AGE.*

BY

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# PREFACE.

My purpose in this work, addressed to persons of middle age and in the decline of life, is *not* to supersede the Physician in treating their maladies, —it *is* to call attention to those peculiarities of the constitution which distinguish age from youth and manhood, to point out those symptoms of deviation from the healthy standard which are usually disregarded, or considered unavoidable incidents of age, but which insensibly glide into fatal diseases if neglected.

A watchful care of themselves by elderly persons, and the adoption of proper measures of relief in the earliest stages of disorder, will, as I have shown, give ease and comfort in place of trouble and suffering, and in many cases ensure the prolongation of life.

The views advanced are the result of very long-

continued observation, but I shall learn with pleasure any modification or addition derived from the experience of others.

I do not hesitate to express the assurance that what I have written, if read by persons for whom it is intended, will convey information and suggestions of great value, and if longevity is esteemed a blessing worthy of some trouble to secure, it will amply repay the time and thought devoted to the subject.

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# LONGEVITY: THE MEANS OF PROLONGING LIFE AFTER MIDDLE AGE.

## WHAT IS THE NATURAL OR NORMAL DURATION OF HUMAN LIFE?

To attain to a lengthened life, to enjoy ease and tranquillity in life's decline, and immunity from pain, debility, and other forms of suffering, are objects worthy of far more earnest attention than they usually receive.

At the dawn of modern science, when the properties of natural bodies began to be observed, men sought to find the philosopher's stone, and an *elixir vitæ*, hoping to preserve life for ever, or at least for a long and indefinite period, and to obtain wealth by a short and easy process.

Since we have more accurately investigated the constitution of man, body and mind, the conditions of life, health, disease and death, the nature

and relations of things around us, we are able to form more rational aims, and to pursue them with better hopes of success.

How to evade the causes of disease, to obviate their effects when they touch us, how to reach the utmost extent of the term allotted to human existence are legitimate objects of research. And since the most subtle and most tremendous physical forces are made subservient to our daily wants, and the composition and interaction of the materials of our earth, animate and inanimate, are to some extent ascertained and utilised, surely we may expect that means and appliances should be attainable to preserve and prolong human life, to render longevity the rule for many, and not, as now, the exceptional lot of a few.

In this line of thought a question emerges which we must meet and answer *in limine.*

How long can men live if exempted or protected from all the influences tending to extinguish life prematurely? What is the term, if any, which Divine Providence has affixed to the duration of human life?

As an obvious fact, numbers reach the age of

eighty or ninety. A few exceed these years, and nearly or quite touch one hundred. There are others, still fewer indeed, who live even longer than one hundred years.

The late Sir George Cornewall Lewis having expressed doubts as to the evidence of any life exceeding one hundred years, much inquiry ensued. The affirmation, if not absolutely proved, must appear to those who have followed the controversy to be most probable. Quite recently however, the first case on record verified by an Assurance society of a person dying at the age of one hundred and three occurred. One such case is conclusive, and must not be ignored in dealing with the question before us. Whilst all the recorded stories of persons living one hundred and fifty to two hundred years and upwards, Jenkyns, Parr, etc., must in the present state of our knowledge be regarded as myths. The very numerous cases claiming an age somewhat beyond one hundred, when no positive evidence could be adduced, are now proved to have no inherent impossibility. (*See Note A*, p. 150.)

There have been many attempts to determine

what is the limit of human life, and various opinions have been advanced based upon data as various. None have appeared so reasonable and so worthy of acceptance as that of M. Flourens, and his views have accordingly attracted much notice.

M. Flourens conceives he has discovered a fixed relation to exist between the time required for the growth to maturity of an animal body, and its ultimate natural duration—all causes of premature mortality excluded.

Taking his observations from the group mammalia, of the class vertebrata, as having the closest resemblance to man, and such species as are permitted to live the full term of their natural lives under circumstances not admitting error or doubt, the elephant, horse, dog, etc., he found that their natural life extends exactly to five times the period of their growth.

Applying the rule thus obtained to human life, and taking the age when the body is fully matured to be twenty years, he concludes the natural duration of the life of man to be *one hundred years.* (*See Note B*, p. 151.)

If these observations and inference are on the whole well founded, a slight modification must be admitted, since it is highly probable that the time of perfect maturity of growth is not an absolutely fixed, but a variable quantity, some individuals attaining it somewhat earlier, some later. It would perhaps be safe to assume that the body has reached its full development and maturity from eighteen to twenty-one. These numbers multiplied by five, would bring the natural life of man to be from ninety to one hundred and five years. This conclusion must, we think, be regarded as the truth, or at least a very close approximation to the truth,—the discovery of a most interesting and important natural fact, or law.

The inference necessarily follows, that all persons who die under eighty years of age, many who die under ninety, some who die under one hundred or even under one hundred and five, die prematurely. (*See Note C*, p. 153.)

And this inference is supported by observations made in another direction; for all pathologists agree in stating that very few persons indeed

die of mere old age. Of those whose lives reach to between eighty and ninety, and even extend beyond ninety, the majority die of diseases which might have been avoided, cured, or kept in abeyance until the full term of human life had been attained.

The Registrar-General, in several publications, has deplored the premature mortality of the people of England, and in most forcible language urged the subject on the attention of all thoughtful persons. (*See Note D*, p. 155.)

## THE PURPOSE AND LIMIT OF THIS WORK.

To trace human life from birth to old age—to point out in detail the known causes which cut it short in infancy, childhood, youth, and maturity—to discuss the occasions and circumstances leading to culpable or unavoidable neglect of precautions and measures for its preservation, would require a work of considerable magnitude. My present purpose is to treat of ONE EPOCH only,—that which may not inaptly be designated *Advanced Age*—in popular language,

*the Decline of Life*,—to show what is the precise nature of the changes in the constitution which take place in that epoch, and constitute in the aggregate *ageing*,—to enumerate the most common and prominent physical troubles incident to advanced age,—to point out the antidotes and means furnished by science and experience for ameliorating or avoiding those troubles, and for retarding the effects of time, and thus for prolonging life.

## IS THE DURATION OF LIFE IN ANY DEGREE WITHIN OUR POWER?

This question may not unreasonably be raised; and it may be well to consider it, and to state briefly the arguments on which an affirmative answer may be founded.

Some persons may be disposed, *prima facie*, to entertain doubts on the subject. The expression in Holy Scripture will occur to them, "There is an appointed time for man upon earth." Such an interpretation and application of this text is not unfrequently made; and we often

hear the phrase, "His time was come," used to modify the sorrow for the premature loss of friends. This must be an error. The expression rather refers to the limit generally of human life—the hundred years of M. Flourens, or the hundred and five as explained above, or the average duration of life in the human race. That it cannot be meant to apply to individuals, implying a fatal fixity to the term of their existence, is amply proved by incontrovertible facts.

1. The average duration of life has increased during the present century in England and some other countries. This is so generally admitted as to need no proof.

2. This average varies with different classes of society, and with different occupations. Thus, the clergy enjoy the longest lives: medical men have the shortest, etc., etc.

3. The rich, or those exempt from the cares and anxieties of business, *cæteris paribus*, live longer than the middle classes, or the poor.

Great longevity is, indeed, not uncommon in eleemosynary institutions, asylums, and union workhouses. The reason is obvious: their inmates

are (many of them, at least), absolutely free from cares; neither for themselves nor their relatives need they suffer anxiety. Generally well fed, clothed, and housed, seldom exposed to external causes of disease (pathogens), they enjoy advantages in these respects not always within the reach of the wealthy, and never of the classes immediately above them in the social scale.

We are able to specify some of the causes of the general extension of human life.

*a.* Sanitary improvements enforced by law.

*b.* The more wholesome and provident habits of all classes—in avoiding the recognised causes of disease.

*c.* Better food, clothing, ventilation, and drainage of dwellings. The use of coal as fuel, etc.

*d.* Draining and cultivation of the land.

*e.* The progress of the arts of healing—medicine and surgery.

The benefits already derived from these and other items of progress, justify the hope of a further extension of the duration of life in the future.

It must be observed, that the extended average

is by no means solely due to the lessened mortality of children and young persons. The obituaries published daily in the newspapers frequently excite attention and remark from the number of *very* aged people whose death is recorded.

The irresistible inference from the above well-established facts is, that material and moral influences abridge or prolong human life. The sum of all science and the instruction derived from experience is that means exist which enable us to prolong life in every stage.

Consequently the enjoyment of long life is,—within limits not strictly definable indeed,—in every man's own power.

## SOME GENERAL CONSIDERATIONS RESPECTING ADVANCED AGE.

While preparing in youth for the struggle of life, or engaged in its active duties, we have scant time or leisure to give to what we deem a distant future ; but when those periods are past, and we are consciously warned that the time approaches

for retirement and repose, we may well turn our thoughts to the questions how the remainder of life can be best preserved from suffering, and whether any and what means may be found to prolong it to its utmost limit.

Satirists have handled, and wits have made themselves merry, with the nervousness and anxiety of old people about their ailments. How sorry would such sallies appear, were they directed against a man's care respecting his dwelling. Should we impugn the wisdom of keeping a house waterproof, of anticipating or arresting decay and dilapidations, of watchfulness and care to prevent injuries from time and weather? What sense would there be in disregarding the loss of a single slate from the roof, the trickling of a few drops of water through the ceilings, the ingress of a puff of air through a crack in the wall? What should we say of him who neglected a loosened beam, or sinking foundations until the whole building was in danger of falling about his ears? Is a man's own body of less importance to himself than his house? If the timely relief of some slight pain, the notice and repair of some scarcely

perceptible disorder in the fabric, or the feelings, may avert acute and prolonged sufferings, or even save for a lengthened time a valuable life,—and every life is valuable,—is it not most unwise to neglect seeking the remedy? Is it not worth some trouble, care, and expense to understand the evil in its source and its tendency, and to counteract it?

When may a man, or woman be considered old? What is the limit of middle or adult age? and when is the line of demarcation between this and the decline of life passed?

This period cannot, indeed, be strictly defined by years. The effects of wear-and-tear are experienced by some at a much earlier age than by others. Mental or bodily labour, cares, violent emotions, anxieties, etc., produce in a briefer time the changes, otherwise requiring years. The phrase, *fast living* is full of meaning. It implies a crowding of pleasures, or sufferings into a shorter compass than natural. Still, we may approximate to the era of ageing. Some have said a man is old at forty-five; others have considered seventy the normal standard. Long observation has con-

vinced me that sixty-three is an age at which the majority of persons may be termed old; and, as a rule, we may adopt this as the epoch of the commencing decline of life. Exceptions, of course, there are; but in a mixed company, few would fail to discern those who may fairly be pronounced old people, as distinguished from the middle-aged; and, we venture to say, most of them would be found, on inquiry, to have reached or passed sixty-three.

Sixty-three, it will be observed, corresponds to what the old philosophers designated, "the grand climacteric"—seven multiplied by nine. They fancied some mystical relation belonged to the number seven and its multiples. And no doubt the successive stages of life are marked by certain peculiarities. In early life we think those stages are septennial; but later, they are rather decades. However this may be, every one is conscious of changes in the constitution, tastes, feelings, mode of thinking, susceptibilities, etc., being marked and recognisable at several epochs of advancing life.

Physiology makes us acquainted with changes in the very structure of our bodies, whence all

the external manifestations of ageing flow. These we shall analyse and describe in the sequel.

Pathologists have often observed that the effects of pathogens (*i.e.*, external causes of disease—poisons, contagions, etc.) differ greatly at various ages. Adults are not liable to many diseases which assault childhood. Elderly persons are exempt from many others which afflict youth and middle age. We know, too, that food and medicine vary in their effects upon us at different stages of life. And, moreover, such diseases as youth and age suffer in common, present, even to superficial observation, dissimilar aspects, proceed in different courses, and issue in different results.

When we first hear the epithet "old" applied to us, we are shocked, and would willingly believe it untrue; but it soon becomes familiar, and we acquiesce in the imputation as inevitable. Those of us display most wisdom who do not attempt to blind themselves to the fact, but begin without delay to consider the new wants age creates, and the new duties it imposes. Conscious of having passed into a new condition of existence, the physiological details of the changes within us should

awaken much interest, and particularly excite another inquiry of no small importance.

Ageing, as we have seen, begins at various periods of life, determined always, or mostly, by the general course of the past. There may be in age a condition regarded as perfect health, although doubtless rarely so, as would be discovered, were a strict examination made in any case. More commonly there may be some defect, damage, or latent disorder in the constitution, the result of special wear-and-tear, previous habits, or attacks of disease long since supposed to have passed away.

When, therefore, a consciousness of ageing comes, the questions should be entertained and answered, Is there any such damage existing? What are the weak points in the system? A careful scientific investigation will supply an answer; and if any special organs exhibit any sign of weakness, disorder, or lesion, whether it be the brain, the heart, the lungs, the stomach, the liver, the kidneys, especial attention should be directed to the part, and appropriate remedies at once adopted. Any organ previously the seat of active disease,

will generally be the first to give way under the general condition of ageing. To urge this by any arguments on persons retiring from the active pursuits of life, and hoping to enjoy a calm and prolonged life, would be, one would think, as superfluous as to persuade them to dwell in houses wind and waterproof, or to regulate the temperature of their houses according to the seasons.

Such an investigation of the constitution as I suggest, may involve trouble and expense; but who that purchases an estate or house neglects to employ a surveyor? What merchant or trader fails to take stock when he begins or quits business?

I am quite sure it often happens at this epoch of life, that some incipient disease may be detected, which, if neglected, would develop and prove fatal in five to ten years, which, if detected and guarded against, would admit of the extension of life for twenty or thirty years.

If this be thought too exalted an opinion of the efficacy of remedial measures, it will scarcely be questioned that many aged persons have their lives embittered by sufferings which could be

readily relieved if due attention were given to them. But regimen, including, of course, everything around us, and medicinal agents with special powers to repair damage and invigorate weak organs, are as available and efficacious in age as in youth. It is a fallacy to suppose age is necessarily accompanied by pain and suffering. How often do we hear the expression, "Oh, he is an old man. What can we expect?" or, "Consider her age: what is the use of medicine?" Whereas I maintain that advanced age ought to be a stronger and more urgent reason for seeking, without delay, every means of relief. The first symptom of disorder in any part, however slight, should receive immediate attention; pain should not be endured an hour in any part without proper investigation of its seat and cause, and recourse to remedies.

It is very generally considered that sudden death is an evil, and that it is preferable for us all to have some warning and forecast of the inevitable end of life. The Church of England teaches its members to pray for exemption from sudden death. We read and hear daily of per-

sons dying suddenly. Careful inquiry of surviving friends, if such there be, will almost always discover that there were warnings, although neglected,—signs, slight perhaps, but sufficient to indicate to a practised eye, had such an eye been directed to them, the approaching catastrophe. And, in no small number of cases there is, at the same time, good reason to lament the neglect, embittered by the certainty that science had resources adequate to avert the deplored issue.

I have already remarked, that the disorders and diseases of aged persons differ greatly from those of youth and adults in middle-life; and it must be added, that they ought to engage the special attention of a distinct class of physicians.

Specialities are not generally in favour with the profession; but the public hold a different opinion. The propriety of such specialities scarcely admits of an argument. The diseases of the mind, of women and children, of the eyes, ear, throat, teeth, etc., have special practitioners, popularly supposed to be more skilful and experienced in their treatment respectively than those who spread their practice over the whole field of medicine.

I am certain that the troubles, disorders, and condition of elderly people demand very special and careful study and observation to understand.

There are several works on the disorders and diseases incident to advanced life, written by physicians of repute. Of these, we may mention Dr. Rush, of Philadelphia, U. S.; Sir Anthony Carlisle, Sir Henry Halford, Dr. Van Oven, Dr. Day, Sir Henry Holland, and Dr. Maclachlan. All these authors treat chiefly of overt diseases, their symptoms, and mode of treatment.

But, underlying such overt diseases, is the cause of the peculiarities they exhibit,—the especial condition of the system in aged persons. This I have found no satisfactory attempt to explain or describe. It is, nevertheless, definite and appreciable enough. Even to the eye of a common observer, some of the phenomena are unmistakable. We are conscious enough of them in ourselves, and our younger friends are not slow in observing them.

It is, however, only when the changes and peculiarities of the system in aged persons are carefully studied, with their relations, antecedents,

and consequences, that we are able to devise hygienic measures, preventive of overt disease and preservative of life.

And when defined, and its several items recognised and described, does the state of ageing admit of being ameliorated, retarded, and the inevitable result of the intrusion of the great and mysterious factor—Time—postponed? This question will be answered in the sequel affirmatively.

Of course, if a life is to be preserved and prolonged by any means or measures, it must be with the sensible and rational co-operation of the individual. It would be very happy for us had we a mystic elixir capable of preserving life, in spite of old damages and injurious habits; but we have not. If life is not worth some trouble for its preservation, my labour in writing is useless. I know the tendency of most persons is to shut their eyes, and glide on to the end; but some will surely profit by information designed, at least, for their benefit. A French writer, alluding to the too common neglect of means and precautions prescribed by science for preserving and prolong-

ing life, says: "Men do not usually die; they kill themselves."

## IS LONGEVITY DESIRABLE?

Is it desirable to live to old age? To prolong life when the epoch of its decline has been reached? When its active duties must be in some measure abandoned and superseded by bodily repose, quiet meditation, and thought.

This can only be decided by each individual for himself or herself.

Not unfrequently, the life of aged persons, heads of families, or otherwise, is of incalculable value and importance to their children, friends, or dependents.

Many people, without considering such ties or claims, may deem a prolonged life desirable for themselves. Having attained the objects of their ambition—wealth, reputation,—or even those who have simply reached a position giving them ease and immunity from care and anxiety after an active life of business, must surely desire to enjoy the quiet and repose of age as long as possible.

Surely, to all such, every available means for the preservation of life, and for attaining the full period of existence, should be of great interest, carefully sought and diligently employed.

Three thousand years ago, a wise man wrote: "There is an evil which I have seen under the sun, and it is common among men. A man to whom God has given riches, wealth, and honour, so that he wanteth nothing for his soul of all that he desireth; yet God giveth him not the power to eat thereof, but a stranger eateth it: this is vanity and an evil disease."

This is equally true at the present moment. Witness the tens of thousands scattered over the whole country, and, indeed, we may say, the whole world, wasting their lives in indolence, self-indulgence, perhaps vice; expending the wealth gained by the labour, anxiety, and often, it must be feared, by means of questionable propriety, of those who had a very brief tenure of it. Surely, if it be desirable to obtain riches, it is not less desirable to have the enjoyment of them as long as the laws of our being permit. Age has real and substantial enjoyments when not marred by suffering.

If God has provided the means, surely it is our own fault if we refuse or neglect to use them. (*See Note E*, p. 156.)

## PHYSIOLOGY OF ADVANCED AGE.

The characteristics of age being open to ordinary observation, a popular term—DECAY—is applied to the aggregate. This word has a very wide and deep signification in science. It is the province of physiology to analyse and define it. As a general expression, it is suitable both in science and ordinary language, but it must not exclude a careful attention to the special phenomena it includes.

In order to render this section intelligible to non-professional readers, it is necessary to make a few preliminary remarks.

Physiologists distinguish the textures of the body from the proximate elements, or materials of which they are composed. Flesh, bones, cartilages, membranes, vessels, etc., the skin, the blood, the fluids, nerve matter, etc.,—these are all made up of a comparatively few materials: albumen, gelatin, fibrin, fat, together with lime

potass, soda, magnesia, iron, chlorine, and oxygen, in various combinations, and a large amount of water,—a compound of oxygen and hydrogen.

It is with these materials that the mysterious principle, *life*, constructs the textures and builds up all the organs, compacting them into one whole.

While life continues there must be a constant influx into the system of raw materials, as food and air. These undergo in the stomach and lungs changes fitting them to become parts of the living blood and textures.

The reduction of these materials into the form of the proximate elements, and appropriating them to build or repair the various organs, is termed digestion and assimilation. A highly complicated, curious, and beautiful mechanism is provided for the purpose, which is the object of the science of anatomy. Passing by the mechanism, we confine our attention to the materials.

Every active motion of the body and mind involves the use and destruction of some part of the substances composing the blood and tex-

tures. After fulfilling these uses they undergo changes, and are finally excluded from the body (excretions). During health there is a normal order, a fixed and regular direction and manner, in all these changes.

We can distinguish two groups of materials, and two series of changes. To one group we apply the term nitrogenous, because the element nitrogen takes the leading part in them. The other we designate carbonaceous, from a similar predominance of carbon.

The materials containing nitrogen are the nutritive parts of food; those in which carbon prevails, the carbonaceous, are for the maintenance of animal heat, essential to preserve the due temperature for all the actions.

The latter, however, have an intermediary use. They become fat, and this aids the mobility of the muscles, and gives rotundity and beauty of form to the surface.

The nitrogenous matters, when used up, pass out of the system chiefly by the urine.

The carbonaceous are thrown off for the most part in the breath.

In the urine, too, the saline constituents leave the system.

It can now be partly understood how any interruption of the supply of food, or pure air, and how any disorder, or disturbance of the changes, the metamorphoses of the constituents or proximate elements of the body, produce various diseases.

Let us now contemplate the condition of a person in what would be termed good health, who would, if interrogated, say, "I am quite well," or perhaps, "I am as well as I can expect;" that is, free from any overt disease, but who has reached the age of say 55 to 70, and is visibly ageing. As compared with the condition in youth or vigorous middle life,—.

1. The *fibrin* of the blood and tissues is of a looser texture—*i.e.*, less compactly organized.

2. The *albumen* is less perfect, forming a feebler coagulum when heated.

3. The *chondrin* (*i.e.*, the condensed gelatin of the cartilages joining the ends of the bones in the joints) is less compact and dense; its spongy texture admitting nodules of earthy matter to be deposited in it.

4. The *fat* is more oily, softer, more fusible.

5. The *bones* are more brittle from a deficiency of the earthy phosphates. (*See Note F*, p. 157.)

6. The *blood* is weak, watery; its coagulum less in amount; its colour is darker; its saline constituents more variable; the total quantity circulating in the blood-vessels is less.

To these conditions of the proximate elements and component parts are referable the flabbiness of the muscles, wrinkled skin, sunken eyes, furrowed face, drooping features, stooping gait, diminished acuteness of the senses, dimness of vision, dulness of hearing, all more or less perceptible in advanced age.

That property of the textures in youth which we call resilience, springiness, elasticity, is lost in age. This fault in the lungs tends to the frequency of fatal congestion.

7. Nervine is the matter composing the brain, spinal chord and nerves. In the nerves, nervine, sheathed in a skin-like covering, is spread throughout the whole body. Where we can best see it, which is in the brain itself, we find it softer, yielding more readily to any slight violence, and visibly

changed in appearance—a change not easily described in words, beyond mere softening.

This matter of the brain and nerves is the seat of feeling and all the senses, the channel of the will and motory power, the mysterious depository of all that is stored in the memory, and probably the agent in all the mental faculties.

Mental diseases in their multitudinous forms, paralysis (frequent in aged persons), obtuseness of the senses, taste, hearing, sight, smell, follow molecular changes in nerve matter (*nervine*).

Such being the condition of the system in advanced life as to its materials, we can readily understand how overt disease may speedily arise in the several organs, appearing to be spontaneous, and how readily disease may be excited by external agents.

On the one hand, some one or more organs will exhibit signs of degeneracy, morbid feebleness, sluggish action, partial or complete loss of power, softening, or other change of texture, failure of their functions. This is popularly termed decay.

On the other hand, susceptibility to morbid influences from without, predisposition to suffer

from changes of temperature—particularly cold, to impressions when exposed to even weak poisons, to temporary fatigue or privation; all these and the like are explicable on the above physiological grounds.

Our state in advanced life may be regarded as analogous to and classed with *diatheses, i.e.*, special tendencies, or predispositions, such as we meet with and recognise in every stage of existence: a liability to some one form of disease rather than to others.

It may not appear very scientific or precise to speak of age, as to its internal characteristics, as a *diathesis;* but this is the nearest approach to a correct definition for the purpose of comparison we can reach. And something is always gained when we can arrange any set of phenomena under a general head or principle. The Registrar-General groups together certain states, or rather diseases, under the generic term *diathetic.*

The general idea being of a latent subtle condition of the system (*diathesis*), when occasional causes produce peculiar trains of symptoms, and modify ordinary diseases.

We may therefore safely speak of the *senile diathesis*, and this simple name may not be barren of results, considering the influence of words upon our inquiries and conclusions.

What of the indwelling life itself? How is this affected by lapse of time? It has been supposed that a certain amount is implanted at birth, which is lessened or enfeebled in age, and at length is worn out and extinguished. The *vital lamp* is a favourite metaphor; and life is assumed to end as a lamp goes out, for lack of fuel. It must be remembered that this is figurative, and we must not push such analogies too far. It is true there is a limited duration to every organized body—a time when its life ceases; but it would seem to be its teguments, and envelop which weaken and decay; to this the law of extinction in time applies rather than to the vital principle itself. Hence, as we have already noticed, few persons die of simple old age; and the vital, as distinguished from muscular or molecular force, is very often observed to be very vigorous in old people. The idea of enfeebled vital power need not in any degree lessen our efforts to prolong life.

Delicacy of constitution, and sickliness in childhood and youth, and even extending into middle age, do not in all cases prevent the attainment of longevity. In reading the memoirs of distinguished individuals who have lived to a good old age, it is very common to find it stated that they were remarkably feeble children. The late Mr. S. Rogers, the poet, said he never knew what health was until he had attained his 50th year.

## THE MEANS OF AMELIORATING AND RETARDING THE EFFECTS OF AGE.

The first item of advice we would offer to persons who have passed the meridian of life is, if possible to secure for themselves mental tranquillity. The secular business of life, if it has been mainly employed, as it is with most of us, in obtaining the means of living and provision for ourselves and families, ought to be over as soon as enough has been acquired to satisfy reasonable wants and desires, to secure contentment and quiet so far as worldly possessions can give them. If with an adequate fortune some object of ambition has

been pursued, with age should come a calm retrospect and estimate of its worth. It is happy for a man who reaches this goal at the age of 50, or earlier. At 60, or as soon after as possible, our desires should be adjusted to our attainments and means, by modifying the former rather than attempting to better the latter by hazardous or even by legitimate enterprises. At least, all mental anxiety or disquietude should be carefully avoided. In this country, indeed, there are very many persons who never have any grounds for an anxious thought. Born to fortune and exempt from ambition, they are nevertheless subjected to the common lot of humanity, beset by troubles of another kind, some real, some imaginary. It is not the idle and listless who, in any marked measure, enjoy the blessing of longevity. Wholesome occupation and moderate means are most favourable to long life, which, as we have before remarked, attaches to the clergy, and to the female sex pre-eminently.

This fact teaches us the next lesson, namely, that *sobriety* is most congenial to health and life. Experience fails to support the pretensions of

the zealous preachers of total abstinence from fermented liquors. A judicious use of wine, the quantity and quality being duly regarded, is certainly beneficial in advanced life. No rule can be given with any approach to accuracy as to the kind and amount of wine which is desirable. So much depends upon previous habits. I, for my own part, as a physician, greatly prefer to prescribe the wine, and define the quantity, for an aged patient who has been in early and middle age extremely temperate. If wine or other stimulant has been indulged in excessively, it is rare, on careful investigation, to find a person at or beyond the age of 63 entirely free from some damage in one, or more organs. Still such damage, if not very considerable, admits of reparation, when there is a resolute will to abstain, or regulate the amount of stimulants by the real needs of the constitution.

As to food, common sense should suffice for every one to observe the effects of any course, or article of diet, and to avoid any which is felt to be injurious. Generally, aged persons require a diet containing most nutrition in the least bulk. Hence

animal substances should preponderate. Generally they will have a preference for mutton, poultry, game, and often for gelatinous food, rather than beef, pork, lamb, or veal. And this preference is in accordance with physiology. Farinaceous substances, although not excluded from the role of diet, should be adopted sparingly; exceptions depending upon special conditions, such as morbid leanness, disorders of the kidneys, etc., which will be spoken of below. We often witness grave errors committed from want of correct information. For instance, arrowroot, or some form of starch, beef-tea, so called concentrated foods, etc., are taken for the muscular debility common in the aged. Under such a diet the weakness continues, and increases often to a fatal end. In the general defect of nutrition some one organ droops in function, and becomes disorganized, to the danger or loss of life.

As with the use of wine and stimulants, the diet of aged persons must be regulated by giving due consideration to their former habits, present mode of living, pecuniary means, and the like; but one rule may be suggested, namely, to divide

the amount of food taken into three or four meals, rather than one large one (dinner usually), in the day. A sense of fulness or oppression after eating should never be disregarded.

As the system in advanced life is more amenable to certain morbid influences from without than in early life, it is advisable for elderly people to be more watchful against them.

A wholesome dwelling, well drained, free from damp, its interior unaffected by changes of temperature without, and admitting free ventilation when artificially warmed, are certain conditions of prolonged life. Nothing is so fatal to old people as cold, and this is intensified by the addition of moisture. Therefore, when possible, a residence should be selected in an elevated position, on a sandy, or gravelly soil, where fogs are rare, and where exercise, walking or riding, can be taken in fine weather without getting chilled, or wetted. Night air, in our climate, ought never to be encountered. The evenings, if not the entire day, should be spent in rooms moderately heated—not too hot—and well ventilated. About 60° F. is the temperature most congenial. The bed-

room especially should be kept at this heat both night and day. A glass-house for walking exercise during the cold of the winter is a great comfort. Exposure to cold with wraps about the throat and heavy clothing, should be decidedly avoided. Some people think it effeminate to have a fire in their bedroom in cold weather: this is a great mistake. Both for warmth and ventilation no means have yet been devised equally advantageous with an open fire and chimney; and by the use of certain species of coal, which burn slowly without requiring to be stirred, a tolerably equable temperature can be maintained through the night. When there is no fire the chimney should be kept open for the ventilation. Disturbed sleep and headaches in the morning are common consequences of the use of a closed register stove.

Of suitable clothing, varying with the seasons, it is unnecessary to speak.

With other misleading advertisements abounding in the newspapers, and trickling down whole columns of the *Times* in particular, hot or Turkish baths are recommended as infallible means of prolonging

life. With respect to the Turkish bath, elderly persons should, I think, never use it, since it is extremely exhaustive, and it is seldom they have any redundant muscular strength. If used, it should be very rarely, and only by advice of a physician.

Hot baths demand also great care. I have often known, and more frequently heard of, cases where they have proved fatal. When there are symptoms of head trouble, pains, dizziness, etc., suddenly depriving the brain of blood, immersion in hot water causes the blood to flow to other parts of the body, and induces cerebral collapse, and either immediate death, or fatal paralysis, or stupor (coma). For cleanliness, and to preserve a healthy state of the skin, I recommend all old people to employ hot water with soap and flannel or sponge (the flannel is best), using a moderate degree of friction. A foot-bath of hot water, with the addition of a table-spoonful of flour of mustard, is very useful when there is fulness of the vessels of the head, continued sleeplessness, or obstinately cold extremities.

The objections to the hot bath do not apply

to the employment of hot air or vapour, the patient being in bed in a recumbent position. There are simple contrivances by which this kind of bath can be readily obtained without trouble. This simple remedy is too often neglected in cases where free perspiration so produced would prove of great value.

A modified kind of shampooing,—consisting of friction over the skin, and kneading of the deeper textures, muscles, and joints,—is a very useful proceeding to remove the stiffness and immobility, and the sense of fatigue after slight exertion, often experienced. This process will often remove the pains in the loins besetting elderly people, as well as impart elasticity to the limbs and agility to their movements.

A tranquil mind, well-selected and arranged diet, moderation in the use of wine and other stimulants, exercise short of fatigue in favourable states of the weather, confinement to a warm house in cold or wet weather, well-warmed and ventilated sleeping apartments, clothing adapted to the seasons, maintenance of the animal heat of the body, particularly of the lower extremities, careful avoid-

ance of external influences tending to produce disease, malaria, and the like; judicious bathing, to secure a healthy skin,—these are the principal points claiming the attention of aged persons, even when enjoying the best health.

To these must be added, immediate recourse to the Physician when any overt disorder or suffering is experienced.

My purpose is not to teach elderly people to treat themselves when ill; but, in the following pages, to deal with infirmities besetting them, which are generally borne without an effort to obtain relief, being regarded as either too insignificant, or as inevitable and irremediable evils. In some instances, such conditions or changes in the system as would be sure to bring, in a longer or shorter time, disorders and fatal disease if neglected, are shown to be amenable to simple and easily-employed measures.

The question may now be asked, whether there is any probability, or even possibility, of the discovery of a physical agent capable of completely arresting the changes in the system constituting ageing, or preserving the integrity of the body

and all its parts with the vigour of youth and middle-age up to the extreme limit of life?

This question is by no means an idle one. If, a few years since, it had been asked whether it were possible for any thing or process so entirely to suppress feeling that the limbs could be amputated without pain, such a question might well have been deemed visionary, and treated with contempt. But the use of anæsthetics has now been practised so long, that their effects cease to excite our wonder, although they are really most wonderful. Not one or two agents with this property, but many, are now known.

Scientific ideas run long in grooves. When a new line is struck and followed, most unexpected discoveries are made. Inferences from analogy are easy or obvious; yet they are often most prolific in results. Inoculation of small-pox led to the discovery of vaccination. When the nature and properties of such agents as the ethers, chloroform, chloral, and its hydrate, are considered, together with their history and the manner in which they became known, we are greatly encouraged to hope for the discovery, at no distant

period, of an agent which shall effectually stay the changes in the system incident to age,—in short, arrest the progress of what we call decay. Whether the mineral, vegetable, or animal kingdom will furnish it, we cannot foretell. Our knowledge of the action of vegetable products on the human constitution, extensive as it is, is yet only of a minute proportion of the whole. Vegetable substances exert a wide and various healing influence. Opium, foxglove, colchicum, belladonna, tobacco, tea, etc., etc., are to a certain extent known. Thousands are partially recognised; but who shall say what future experiment may bring to light? (*See Note G*, p. 158).

It is, however, rather to a comparatively new class of bodies we look as the most probable source of the great desideratum. The chemistry of ternary and quaternary compounds, formerly designated organic chemistry, presents us with what is practically an illimitable number. To this class of substances belong the most energetic and manageable anæsthetics; and, either by enlightened inquiry, or as the result of some accident, it is almost certain some of them will be found

to exert a powerful action on the living system. Already, out of the line of anæsthesia, or narcotism, we have one of these artificially prepared substances, which promises to be a remedy for that habit of body termed the gouty diathesis—a condition so very frequently issuing in overt and fatal disease. (*See paragraph on Gout.*)

By the combined aid of physiology and chemistry, we are approaching very closely to an exact knowledge of every kind of material (proximate elements) forming the human body—their exact constitution, composition, and mode of formation. Some of them can be made artificially in the laboratory,—a certain proof of science being on the right track. We may, therefore, look with confidence to these sciences to investigate completely the changes induced by diseases which are most frequently results of the intrusion of foreign substances with the air, water, or food, into the processes of formation, sustenance, or decomposition of the natural compounds. The changes in ageing are consequently not beyond our reach; and it is probable that a rational and scientific basis will be laid ere long for completely arresting them.

Whilst great energy and vast sums of money are expended on experiments in mechanics, electricity, etc., the means of arresting disease and prolonging life are left to haphazard individual efforts, seldom or never rewarded.

Jenner's case is singular. Philanthropy is in complete subjection to fashion and precedent. Still I feel assured if the public could be brought to apprehend the prospect of success by investigations instituted with the object of discovering the means of prolonging human life, pecuniary aid would be forthcoming. It is only by well-concerted efforts, and having definite ends in view, that our present science can be made available for the purpose. Its processes are very costly, both in time and money, but in a country where wealth so abounds, the latter ought not to be the obstacle. There are men, too, quite capable and qualified, but they are necessarily engaged in other pursuits, whilst most erroneous ideas on the subject generally prevail. At some future time, the indifference and neglect of the present will excite remark and wonder.

In the meantime we must proceed in another

direction, guided simply by experience and such analogies as may be found and accumulated by observation. Much has already been done, but very few have the full benefit of the knowledge already obtained.

A healthy and vigorous state of every part and every organ is essential to the health and well-being of the whole system. And as ageing—or what is the same to our means of observation—begins sometimes locally, and sometimes over the system generally, we first look for the local degeneracy, and, finding none to call for special remedies, we address ourselves to the entire system. We have many and most valuable agents capable of invigorating and imparting tone to the whole. And these, judiciously selected and combined, and administered with a full knowledge and control over the diet, regimen, and habits of a patient, will greatly ameliorate the effects, if not retard the advance, of ageing. He must have had little experience who has not seen this influence exerted by well-selected remedies.

The special disorders of the system, and those commencing locally, will be described in the sections following.

RECUPERATIVE POWER—VIS MEDICATRIX—LIFE.

We have one well-established fact, highly encouraging in the research for means to arrest ageing,—a fact at once very curious and instructive. It is that the natural healing, or recuperative power termed *vis medicatrix naturæ*, to which the physician and surgeon look in patients at every period of life as an essential element in the success of their arts, remains in the system in old people until a very great age. By virtue of this power we see broken bones unite, the assaults of disease resisted, and recovery occurring after considerable injuries and severe attacks. And it may fairly be inferred that the changes, degradation, and decay in age, are disorders and unnatural incidents of that epoch of life, inasmuch as we see the efforts of this power exerted to resist and control them.

Thus the tastes and appetite of elderly people vary from those of youth and middle age, guiding the choice of food and its amount, and to the kinds and quantity of stimulants, and other drinks. Animal food, aromatics, bitters, the

alliaceous tribe of vegetables are generally preferred, and a due supply, with other items of living, tends greatly to check or keep the changes of age in abeyance. The desire for mental and bodily repose, sensitiveness to cold, etc., etc., point in the same direction.

Science has not at present obtained any clue to the mystery of life. The difference between a living and a dead or lifeless thing, is obvious enough. We recognise life as an attribute of organisms—bodies with a mechanical arrangement of their parts, and in other conditions or states. Life exists without sense or motion in vegetables, in seeds, in eggs; with feeling and motion, but without thought in many animals, with instinct added in others, and with superadded faculties in some; in man only associated with mind. Life in organisms is an individual thing, special and peculiar in every species. In the more complicated animal structures there is but one life. Destroyed in any considerable part, it ceases throughout the whole. There is no such thing as a diffused or general life. In this it strongly contrasts with electricity, caloric, light, although

there is a certain analogy with it and these bodies or forces. They are moreover all essential to the continuance of life, but so also is water, and more or less other matters of a grosser and ponderable nature. It is as absurd and false to represent electricity or heat as being identical with life, as it would be to identify it with water, or phosphorous, or iron, or the materials which it animates. The term protoplasm has been applied to material not only always present with life as its invariable tegument, but imagined to be independent and separate from organized species.

Inasmuch as we know, as a matter of fact, that life exists in connection only with certain compound substances made up of a few elements, we must take this as an ultimate truth admitting no explanation. We may call these compounds protoplasm, or bioplasm if we like, but these terms explain nothing. People pretend to define life just as our ancestors used to define light, deceiving themselves with words. Life is essentially something *per se*. It cannot be transferred from species to species, or individuals to individuals. It is transmitted by descent. It flows in species

in the downward stream of time. The individual dies, but the life which has passed from him to his offspring continues, and passes on from generation to generation. Why two sexes are needed for this continuance of life we know not, but so it is. There is no subject on which more nonsense has been written by men having a reputation for science, than this. They prove themselves to be unacquainted with the very first lesson taught by the logic of science, not to confound resemblance with identity. Not to distinguish life from its teguments and appertainings, is to violate both science and common sense.

For an individual life to continue in existence, the integrity of its envelope,—the body in which it dwells,—must be preserved. And the means we must employ to ensure its continuity and normal energy must be directed to the body, its textures, its organs, its processes, and actions.

These remarks are designed to dispel illusions and false notions now very prevalent and besetting persons not versed in true science, and to direct attention to the real and only method we must pursue to promote human longevity.

## WATER.

When it is considered how large a proportion of water enters into the composition of our bodies,—considerably more than half our weight consisting of water,—and how many functions it performs during life, it becomes evident that the question of the purity or impurity of that which is imbibed becomes of paramount importance in relation to health. The average amount taken into the system by every individual in some shape or other, may be reckoned at about three pints per diem.

As the vehicle of the introduction of many subtle poisons it is now popularly recognised, and the pressure put by the Government and the Press on companies supplying water to towns is necessary, if we wish the people to enjoy health. Attention directed to wells and other sources whence families are supplied is demanded from every one who has influence in the matter. This is at present very partially accomplished.

Much has been done toward obtaining a supply of wholesome water to the larger towns. The

greater part of the organic matters formerly taken without a suspicion of their injurious nature are now excluded; and by filtering and other expedients, all or most of the impurities suspended in water are removed before it comes into our households. So far well. But when we are inquiring into the causes of premature decay and susceptibility to disease, we must needs look closer into the character and properties of the water taken habitually for months, years, and decades.

After all possible precautions have been taken to secure pure water, this is never done perfectly. The least impure water ever obtained still contains a notable quantity of earthy matter: lime and magnesia salts, soda, potash, etc. Hard waters contain these in the greatest although variable quantities, and the effect of taking, say, three pints daily of such water may be somewhat appreciated by observing the deposit found on the inner surface of the vessels in which they are boiled. In fact, a quantity of these saline matters is taken into the system quite sufficient to account for many disorders, the origin of which is otherwise inexplicable. It does not matter what may be combined with

the water, or how it is treated, whether taken as tea, soups, spirits, or beer; the earthy substances are there. The deposits so frequently seen in the ligaments about the joints, on the coats of the blood-vessels, and about the heart, in old people, probably have come from this source. And when we is discussing the question, how to preserve and extend life in advanced age, the character of the water habitually taken must be regarded.

The amount of lime salts and other earthy matter is greatest in spring-water; next in that from streams and rivers; while in rain-water carefully collected in clean reservoirs, there is little or none. But rain-water is by no means free from contamination; much organic matter is usually found in it, and it readily dissolves substances of which cisterns are made, and even the lead of the pipes through which it flows. Iron is the least injurious constituent found in water, and its presence is very common. If the precautions against injurious agents are perfect, they will include, not merely the use of the softest and purest water supplied by nature, but absolute abstinence from any water except it be distilled.

There is only one objection to the use of distilled water, whether as a beverage, or in tea, for cooking, etc., namely, its cost. This surely may be entirely disregarded by most persons who are willing to incur some amount of trouble and expense to secure for themselves a long life.

It is true that distilled water is very vapid and unpleasant when drunk without admixture; but a water drinker may easily make it, not only tolerable, but delicious, by saturating that used for drinking with carbonic acid gas. The apparatus for making this gas and charging water with it, is simple and inexpensive, and the process is easy.

There is another suggestion I would make, as to the use of water by elderly people. It is that they should occasionally and often substitute pure hot water with their meals for all other drinks, especially if any feeling of oppression and fulness is experienced after eating.

Not lukewarm water, which produces nausea and is disagreeable to the palate, but water as hot as it can be taken. Water at a temperature of 120 F., is very pleasant to the taste, and congenial

to the stomach. It promotes the digestion and assimilation of the food, and will generally, if taken freely, supersede aperient medicines, whilst it will equally correct a disposition to diarrhœa.

If plain hot water should be imagined to be inadmissible, the addition of a small quantity of some light bitter, such as is acquired by pouring boiling water on a slip of dried orange-peel, and allowing it to cool down to the drinking-point.

There is sold by druggists a concentrated infusion of orange-peel, a teaspoonful of which added to a tumbler of hot water imparts a bitter very agreeable to most persons. This saves trouble, and proves a valuable promoter both of appetite and digestion.

An eminent surgeon has recently amused and surprised a large audience by expressing the opinion, that the importance of obtaining pure water is exaggerated. He regards it as a matter of indifference whether we drink one kind of water or another, alleging that as it can never be found perfectly pure, a little more or less of organic or earthy matter may be disregarded. We are so accustomed to have in popular assemblies the

strangest notions and paradoxes advanced, apparently with no other view than to startle the world, that we need give little heed to this, which is contrary to all experience and science. The surgeon's faith is in his knife. Suppose a chemist were to employ impure water in his investigations, what would be the value of his results? The human frame is far more sensitive to the action of agents, and its processes more easily disturbed by the presence of foreign matter, even in the minutest quantities, than any chemical compound. Common sense is adequate to judge and determine this question.

### MINERAL WATERS.

In all ages the water from springs, hot or cold, holding salts and minerals in solution, has been recognised as salubrious to the healthy and remedial in many diseases.

The subject of the composition of mineral waters, and the value of any especial one, in the disorders of advanced life, is too large to be entered upon here.

Two cautions worthy of attention may be given

to persons past middle life, respecting their use of mineral waters.

1st. In resorting to any spa or watering-place, and adopting the use of the mineral water, elderly people should consider—1. The climate. 2. The effects of the journey. 3. The change of habits involved. 4. The exact nature and properties of the water. The step should not be taken at haphazard, or because commended by others on the ground that they were benefited by it. If A extols a remedy which cured him—B should hesitate to employ it unless he is quite sure his own case is the same.

2nd. The next precaution may be best understood by an analogy. A farmer finds the soil of a field in a bad state—his crops failing. He employs a dressing of lime, and finds its effect great and satisfactory. His crop, from that field, is doubled the first year. He employs another dressing of the same kind the next year. He thinks the land improved, but in a far less degree. A third time he uses the same dressing, and the result is a total failure. He has inflicted a positive injury on his land.

In a manner precisely similar, an elderly person takes a course of mineral water, well selected, we may suppose, for the purpose. Its influence on the general decay which has begun within his system is most favourable. He is invigorated, and rejoices in the elasticity and vigour which it has imparted. The next year, of course, the remedy is repeated. There may be some good produced. The third time, not only is there no advantage derived, but serious and even fatal consequences ensue.

The introduction of mineral salts into the blood and tissues the first time supplies a real need; the very same mineral salts in excess are deleterious, and really poisonous.

The life of the Emperor Napoleon III. was evidently cut short prematurely by just such a proceeding with the waters of Vichy. A city millionaire, within my knowledge, was recommended the internal use of Seltzer water. Its effect was at first extremely beneficial. He went on with it to excess, and the result was an injury to the constitution which proved fatal.

## STIMULANTS—SPIRITUOUS AND MALT LIQUORS—WINE.

To the general remarks, page 32, the following may be added.

The advocates of total abstinence signally fail to produce evidence in support of their opinion that wine, beer, and all stimulants, are inimical to health and longevity. Their bold assertions are of no more soundness than the Bacchanalian songs which represent wine as the panacea for all human ills.

Science, common sense, Holy Scripture, and all experience, testify to the benefits to be derived from wine when used in moderation and with proper restrictions. Malt liquors may be regarded as equivalent to wine. They contain some portion of stimulant with much real nutritive matter.

I am speaking to elderly people; and, as a Physician, I say—a portion of good sound malt liquor, be it porter or ale, taken with the food, satisfies the appetite, and prevents the repletion apt to follow a meal of mere animal and vegetable

food. The quantity, as a rule, should not exceed eight ounces.

In replacing them with wine, especial regard should be had to its quality. The artificial mixtures called wines may be a source of much mischief. If really good wine can be obtained, "the pure blood of the grape," the selection of the kind to be preferred is of less moment. The light wines of France are suitable for six months in the year only, in this climate. For the rest of the year, good port has no equal. The change from one to the other is also beneficial. If those who have taken wine liberally would gradually reduce the amount to four or even two ounces of port, sherry, marsala, or madeira, at dinner, they would do well. The same amount for those not previously accustomed to it, and who, from debility, sluggish circulation, or other reasons, adopt it, should never be exceeded.

Sherries are too often sophisticated; marsala is much recommended as likely to be pure and less acid. It is good to vary the kind taken. The number and names of wines submitted to our choice is legion. It should be a rule to avoid for

ever any wine found uncongenial to the stomach or to produce head-ache. (*See Note H*, p. 163.)

It is always best and most advisable for all persons to abstain from the daily and habitual use of ardent spirits altogether. They should be reserved for emergencies. And it is wise not to refuse them when real need arises.

A sudden indigestion, spasms, a chill caused by exposure to wet or cold weather, temporary depression of the vital forces, justify the use of spirits in proper quantity; and in such cases they are invaluable.

Elderly persons who in winter suffer from cold feet, and find artificial heat applied externally fails to afford relief, may with undoubted propriety and advantage take half an ounce to one ounce of brandy, rum, or whisky in hot water on going to bed. The choice must be determined by the effects. If a headache or foul tongue in the morning follows, the inference is,—the spirit was impure, probably containing fusel oil. A very slight trace of this noxious ingredient in spirits, will, in some constitutions, produce headache—as accurate a test of impurity as chemistry can employ.

There is a form in the British Pharmacopœia for a brandy mixture, intended for use in the collapse occurring in many diseases. As all the colleges concurred in producing that work, we may assume that a large proportion of the physicians of Great Britain approve of this occasional use of ardent spirits. A pamphlet circulated extensively by the Temperance League, charges the profession with exciting and abetting drunkenness by this use of spirits. It maintains that we ought in emergencies rather let our patients die than administer alcohol in any form. Such fanaticism neutralizes all the arguments in favour of total abstinence.

## CLIMATE, ITS EFFECTS ON LONGEVITY.

If the recorded cases of persons who have attained to a great age, say 90 and upwards, are tabulated according to the locality where they have occurred, it might be concluded that climate has had little influence. In every part of the world, in every county and district in this country, such aged persons have been and

are still met with. Against the acknowledged longevity of those classes whose wealth enables them to enjoy a change of climate whenever they please, we may set the frequent observation of the clergy, the female sex, the pauper, all of whom are most commonly obliged to spend their time within a very narrow range of place.

And yet it must be admitted we have ample testimony to the great benefit to health derived from a resort to milder climates during our cold, wet, fickle, and inconstant winters. If, however, during this season due precautions are taken by elderly people, a rigid avoidance of exposure to cold, damp, unfavourable winds, they will, in most cases, do as well in England as anywhere. Of course, in exceptional cases, where some failure of a local organ, the lungs and air passages more especially, already exists, a resort to a warm climate may be advisable. The range of choice is now—thanks to steam and rail—very wide. Every quarter of the globe is available. Fashion has ever been the guide, and probably will continue to be so. Without being able to give any very definite statistics on the subject, I have a

well-grounded suspicion that in many places of resort for change of climate, there are circumstances and conditions tending to counterbalance their advantages, by exposing visitors to forms of mischief different perhaps in kind from those they would encounter at home, but equally injurious and opposed to the attainment of long life.

A really fair and impartial estimate of the character of scarcely any of those resorts is obtainable; so many interests are involved, concealments practised, and motives existing, to allure the stream of visitors, that the real facts cannot be ascertained.

The refreshment of change to this place or that, of immunity from the cares of home and business, the mild occupations of the mind, and the bodily exercise usually associated with the climate, greatly benefit the young and the adult; although how often do we witness one or more children of a large family—and even an adult—given to these migratory habits fall victims to some local and fatal disease?

The choice of a place to elderly people in search

of health and invigoration must depend upon their actual condition. This should be well and accurately ascertained, and suitable precautions observed to guard against all local influences to which they may be exposed in the place selected. Thus we not unfrequently meet with patients who have brought home with them the effects, or even the active poison of malaria (a very subtle cause of exhaustive disease), rheumatism, urinary disease from impure water, or the too long use of acid wines, and other diseases contracted in some place resorted to for health.

Upon the whole, I am inclined to think the majority of persons who have passed the line of demarcation between adult and old age would do best by making judicious arrangements at home for warmth, pleasing occupation, exercise, and diet.

A residence in India and other hot climates appears to be not unfavourable to longevity when no permanent damage is left by the diseases prevalent there. It would be interesting to know what proportion of a given class, civilians for instance, escape injury and return to England with sound constitutions. Those who arrive with

the traces of former attacks, fever, dysentery, liver disorders, etc., are exceptionally amenable to remedies, the changed conditions surrounding them being very favourable to a cure. I have known many persons who have spent the greater part of their lives in India and other hot countries who have reached a good old age.

### DEVIATION FROM AVERAGE HEALTH IN AGED PERSONS.

Let me repeat, it is not intended in this work to treat of such diseases as would naturally and commonly claim attention and the assistance of the Physician; but such deviations from health as are generally neglected, from the notion that they are insignificant, or necessary conditions of age.

In like manner, although some medicines or remedial agents will be spoken of, a full account of their properties is not necessary here. If more information is desired on either branch of the subject, *i.e.*, diseases or remedies, the author would refer to his volume, entitled, "Household Medicine."

## FAULTY NUTRITION.

The primary and fundamental condition of the continuance of health is a supply of food and its assimilation; that is, its conversion into healthy blood, from whence, through the circulation, every part and organ receives nourishment; in other words, material suitable for its sustenance and repair. For in every part there is a constant process of wearing away and restoration; and if the balance of waste and repair is not maintained, disease quickly ensues.

Every one knows that several organs are concerned in the process of nutrition: the stomach, liver, pancreas, spleen, upper and lower bowels. Certain fluids are formed, with power to dissolve, mix with, and modify the food, until it mixes with the circulating blood, and is endued with life. The blood-vessels and lungs take important parts in this business.

When any of the digestive and assimilative organs are enfeebled or diseased, we address our means to its relief. In the sequel, some of the disorders of these organs will be noticed.

Here, we would observe there is a state often seen in aged persons, evidently referable to imperfect, or interrupted nutrition, and yet we are unable to refer it to the failure of any of those organs in particular.

This state is a marked and evident general loss of flesh without suffering, often with pallor of the surface, especially noticeable in the cheeks; with the obvious attenuation, there is not unfrequently lightness of movement, cheerfulness, mental clearness, good appetite, and easy digestion, so far as the stomach is concerned; whilst all the bodily functions appear natural, the loss of flesh proceeds. Sometimes morbid sleepiness and undue fatigue after moderate exercise will be observed. Neither patient nor friends take much heed of the change. Perhaps some modification of the diet is adopted, and articles of food are recommended which are entirely valueless: arrow-root, beef-tea, Liebig's extract, or other equally wrong substance.

Whenever an aged person thus loses flesh and colour, attention should be given to it in a sensible manner, even when apparently in other respects

well. Since if it goes far, the susceptibility to cold and other external influences, to assaults of ordinary diseases, becomes greatly increased, and what would, in ordinary circumstances, be a slight attack or injury, may prove fatal.

A considerable change of diet should immediately be adopted, and any habits calculated to weaken the system abandoned.

The food and regimen to be adopted, must depend much on the manner of living previously. As a general rule (and only such a rule can be given), food rich in albuminous or staminal principles, such as eggs, with solid but juicy and tender meats, are to be recommended as the staple articles. Light wines, if before taken habitually, or even more generous port, sherry, or marsala, should be replaced by good stout. Aërated bread substituted for ordinary bread. It is true that the heat employed in baking bread destroys to a great extent the fermenting power of yeast; but something remains in bread made with yeast which renders it more liable to undergo changes, and with moisture and heat to become more rapidly sour.

Fruit and pastry should be taken sparingly; and as a diluent of animal food, rice should be taken instead of potatoes. Green vegetables, either cooked or raw, as they are eaten in salads, must be selected in accordance with other considerations. They supply potash, sulphur, and iron compounds when duly digested.

Fluids should be taken sparingly (see Water). Cold bathing should be abandoned, and hot water with friction, by means of soap and flannel, substituted.

Gentle exercise in warm weather is advisable; but cold air, especially when damp or at night, carefully avoided.

In the condition described, when loss of flesh is noticed, the susceptibility of the system to injury from cold is greatly increased.

A considerable proportion of the day should be devoted to entire repose.

Of change of climate I have already spoken.

If these, or similar means produce a favourable change and flesh begins to increase, there will be no need of drugs.

In some cases, some of the preparations of iron

are very beneficial. It must be remembered that iron is as truly an aliment as albumen.

Cod-liver oil is fashionable for all cases of leanness; but its use by aged persons, whose means allow of a free choice of aliments, is unnecessary and hazardous.

A weak infusion of orange-peel, chamomile, calumba, or other light bitter, with a slight acidity imparted by dilute sulphuric acid, is good and grateful. Sage, balm, or wormwood tea have been in repute. But a judiciously selected diet, with the other items of regimen described above, are usually efficient.

## LOCAL FAILURE OF NUTRITION.

Physicians have always sought for guidance in the treatment of disease in the living by the changes to be seen after death. The disorganizations thus discovered are the results of disorders when they have done their worst. There can be no doubt that there is a disordered condition prior to, and the cause of, such morbid changes.

It is to the very first and initiatory symptoms, our attention must be directed if we would save life; and these must be correctly interpreted.

With respect to the point before us, I am certain that fatal disease of the kidneys (degeneracy, as it is termed—Bright's disease),—disease of the brain,—softening, for instance, and lesions in the structure of other organs,—are the results of a failure in the nutrition of such parts. They do not get, or they fail to appropriate the materials from the blood essential to their integrity and health. They shrink, shrivel, and lose their power of action. The root of their troubles is in the processes of assimilation. Hence the necessity of very close and minute observation, to detect the very first indications of disorder in aged persons.

## OBESITY.

The counterpart of the condition described in the foregoing section is a tendency, after middle age, to become too fat.

The popular expression applied to persons of a rounded form, moderate embonpoint, clear skin,

and a ruddy colour,—that they are "in good condition," accords with science. This condition is most commonly accompanied by healthy internal organs—a very desirable and hopeful state.

When fat is increased beyond a certain limit, it may be regarded as disease; yet until it becomes burdensome, it is generally disregarded. When it accumulates locally about or within vital organs, the heart, liver, etc., it shortens life. In elderly people, fat often accumulates in the mesentery (this is the organ known in animals as the flare), producing the prominent or pendulous abdomen.

It is a strange thing, although often observed, that the public will receive from writers, avowedly entirely ignorant of medicine, suggestions respecting treatment with more favour than from the scientific Physician. Hence the great popularity of a pamphlet and plan of Mr. Banting for the relief of obesity. It was, in fact, only his Physician's advice related and expanded.

A proper regulation of the diet and exercise will generally remove undue obesity. All fatty matters, sugar, and starches, should be avoided.

Pastry, puddings, rice, and farinas, strictly forbidden. Lean meats, green vegetables, whole meal bread, salads, a free use of vinegar, soda or potass water as the only beverage, except tea, and this without milk and sugar,—these should form the diet. Spirits, beer, potatoes, butter, must all be abandoned. Vapour baths and occasional enemas of soap and water aid in the reduction of fat.

Of course the Physician can aid these domestic measures by medicines; and it may be safely affirmed that no one need suffer long from the troubles incident to obesity, if he, or she will take the necessary precautions and means of relief.

## PAIN.

### THE USE AND MISUSE OF NARCOTICS.

The nerves, the seat of pain, pervade in the form of fine fibrils every part and every organ of the body; proceeding from the brain and spinal chord, as thin chords, they pass to and spread through the various tissues and even the bones.

Pain arises from any kind of lesion, whether external injury or internal change. It comes in every degree, from mere uneasiness, to acute and unbearable agony, almost always accompanying disease of every description.

The opinion has been held that aged persons are not so sensitive to pain as younger people: my own observations do not permit me to agree with this. It is true, individuals differ at all ages in their sensitiveness and power of endurance. I have noticed aged persons suffering most acutely from slight operations, the extraction of a tooth, or the prick of a lancet, whilst they will often long endure dull though distressing pain without seeking relief, under the idea of its being incident to age.

This is at all times, and in all cases an error. If the nature and exact seat of pain is not at once discerned, if a remedy is not immediately found, this should rather excite greater care and more diligent search for the means of relief.

Pain, wherever situated and of whatever degree, should in every person advanced in life be relieved. And science has furnished the means.

It may be first remarked, that local pain does not always imply lesion or disease in the part where it is felt. This is one of the phenomena of the sympathy existing between different organs often remote from each other. The sagacity of the Physician is often tested by his ability to refer accurately to the seat of disease indicated by pain in a distant part.

There is much in the pains of aged persons of great interest in relation to the question how life may be prolonged to its full limit.

The process which, for brevity, I may term decay, is, I am persuaded, almost always attended with pain. This decay, or ageing, does not indeed go on simultaneously in all parts of the body; one part, or more, may thus change before others; the locality of the pain not obviously indicating the part affected.

There is, however, very frequently in advanced life, a widely diffused pain in the limbs, loins, back, and even affecting the muscles of the chest and abdomen, to which I think a proper designation has not been appropriated—I would call it

pains which we constantly hear spoken of erroneously as *rheumatic.* Rheumatism and rheumatic pains, in popular language, stand for not one but many kinds of pain, having different seats, different causes, and origin; and if properly treated must be subjected to different plans of treatment.

Dolor senilis is of very various degrees of intensity; sometimes it exists as a mere general uneasiness or discomfort, often being aggravated in bed, or on first rising in the morning; sometimes it becomes severe, and it is the more severe kind which is termed rheumatic.

Long observation and treatment of aged persons has satisfied me that there are also cases of this diffused pain, more or less severe, caused by the presence of poisons. Calomel, or other mercurial salts, having been taken for other diseases, and very properly so, will, even years after, reveal a lingering existence in the system, by pain, often deep-seated, generally appearing to be in or upon the bones. Pathologists have recognised a chronic inflammation of the covering of the bones (peri-

ostitis, as it is termed), certainly referable, among other causes, to the prior use of mercurials.

Malaria occasions similar diffused pains, when it is received into the system in too feeble a state to manifest its true character: *i.e.*, failing to produce fever, agues, or periodicity in attacks. The connection of malaria with neuralgia, a term applied more especially to pain seated in the larger divisions of nerves, and running along their course, is generally recognised.

True rheumatism and gout also may be the cause of diffused pains without any overt or distinct revelation of their true character.

There are moreover other states, termed, for want of a better or more discriminating term, *cachexia*, or bad habit of body, the source of such pains.

It is of primary importance to distinguish clearly these several cases; namely,—

1. Simple age.
2. Mercurial or other mineral poisons.
3. Malaria.
4. Rheumatism.
5. Gout, often termed rheumatic gout.

6. Cachexia,—undefined bad habits of constitution.

It need scarcely be said, remedial measures of every kind must be selected appropriate to each. It is too usual to jump to the conclusion, without very minute inquiry, that all pain in old people is rheumatism,—to try a variety of remedies at haphazard, and on their failing the suffering is submitted to as inevitable.

No one so suffering, and failing from ignorance or carelessness to obtain relief, can reasonably hope for a very long life.

## NARCOTICS.

We have a long list of medicines capable of relieving pain of almost any kind temporarily, termed narcotics, calmatives, sedatives, etc. And very precious they are, enabling us to afford relief from pain more or less perfectly, and even if only temporarily, when it becomes too severe to be borne with patience, they cannot be too highly prized.

These may—nay, must—be employed, but it

should be with great caution, and always bearing in mind that for the most part they act by *benumbing the seat or centres of feeling*, without touching, or remedying the source and origin of the pain. In all cases, besides affording immediate relief by judiciously selected narcotics, the nature and cause of suffering should be carefully sought, and appropriate remedies, diet, and regimen had recourse to.

The vegetable kingdom has until recently supplied us with these agents, but most remarkable and powerful ones have been discovered among the artificial bodies prepared by advanced chemistry.

The former are: 1. *Opium*, its educts and products: morphia and its salts, codeine, narcotine, etc.

Besides these, there are preparations of opium varying in properties and application by reason of the vehicle in which it is dissolved, or some adjunct modifying its action: laudanum, liquor opii sedativus, wine of opium, confection of opium, etc. The last of these is a modern representative of compounds which had a great re-

putation for ages for the relief of suffering and procuring sleep, under the names theriacum, mithridatum, etc.

2. *Tobacco.* 3. *Henbane.* 4. *Belladonna.* 5. *Aconite.* 6. *Conium.* 7. *Cannabis Indica.* 8. *Solanum nigra.* 9. *Thapsus verbascum.* 10. *Veratrum viride.* 11. *Foxglove,* etc.

The latter, *i.e.,* artificial compounds, are: 1. The ethers, of which there are several. 2. Chloroform. 3. Chloral in combination with water—hydrate of chloral. 4. Amylene, etc.

These, as well as the vegetable narcotics, have severally special applications and properties, no one being precisely like another in its operation or efficacy in relieving suffering.

It is not surprising that, in order to obtain ease and secure sleep, the use of narcotics should be adopted without medical advice or sanction; nay, that it should become habitual, and pass into a vice scarcely less injurious than drunkenness. We can understand this misuse of narcotics, while we deplore it. Let no one, however, suppose that he or she who indulges in narcotics to obtain a spurious ease will ever attain to length of days.

In the stupor so induced, many diseases march on, to their inevitable destruction.

If there are any exceptions, we may perhaps make them in favour of tobacco and opium. Much has been written against the use of tobacco, but there are very few cases where it can be charged fairly with abridging life. In consequence of its power of calming nervous excitability, of rendering the mucous membrane of the air passages less susceptible of the influence of cold and damp and the cause, whatever it may be, of influenza, it must when used in moderation rather tend to promote longevity. I have known very aged persons who have been smokers for the greater part of a century.

With respect to opium and its numerous preparations, I concur fully in the eulogium passed on it by the late Mr. Skey, and deem it of incalculable value to old people. Of course, its use must be guided by experience ; but I should little esteem a Physician who has any prejudice against it. Employed judiciously, externally or internally, it is a powerful remedy and source of comfort.

A very common trouble of elderly people is

an irritable state of the bladder, causing a too frequent necessity for passing the water, and sometimes very severe pain after passing it. This is most effectually relieved by a few drops of laudanum; but since this condition of the bladder is produced either by the presence of calculi, gravel, or a morbid state of the urine, its cause should be sought, and proper remedies employed, while temporary relief is secured by opiates.

Again: nothing is more common than irritable ulcers on the legs or other parts in old people. Trifled with or acquiesced in for years, they will seldom, if ever, resist the proper use of opiate preparations, applied locally. Such ulcers and, we may add, local irritations without ulceration, beset many after middle life; and I have seen them healed, or removed, after existing many years, and in persons after ninety. It is an error to suppose there is danger in healing long-standing ulcers or skin disease by means of opium.

In spasmodic pains, whether of the stomach (where they most commonly occur from the presence of some indigestible substance) or else-

where, ether or chloroform afford relief most readily.

Of bronchial irritation and painful cough I shall speak below; merely remarking here, that the proper selection of the means of relief from the class of substances we are speaking of is of great importance.

Pains and griping in the lower bowels find immediate relief best from opiates, demanding, however, that the cause should be sought and removed.

I would repeat, it is not my intention to afford patients the means of treating themselves for any overt attack of disease, but simply to indicate, firstly, the common deviations from health in elderly people; and, secondly, the direction whence the remedy is to be found. One exception to this is in the diffused and oft neglected pains described above as *dolor senilis.*

There is one great and valuable remedy, having a wide range of influence, which I cannot pass by; since, whether such pains arise from the decay of age, poisonous taints in the system, cachexia, or, in fact, anything except gout, it will

afford great and often permanent relief. I mean sarsaparilla. This root, having no very marked or peculiar sensible properties, has long been recognised as a valuable remedy. It is usually taken combined with other ingredients, added rather to produce a pleasant flavour than for any medicinal properties, under the name of "compound decoction." There are people who hold that sarsaparilla has no value as a remedy. They must either have had no experience, or have been imposed upon. I have prescribed it for numberless patients, and have, in my own person, proved it to be worthy of its reputation. The following passage, abridged from "Household Medicine," indicates, not only the sources of fallacy in those who do not recognise its value, but also the scope and conditions of its influence. The authorities in its favour are too numerous to be named; but I may mention the late Sir B. Brodie as an author whose views exactly coincide with my own upon this point.

"One great advantage of sarsaparilla is that its use can be entrusted to the patient, needing no watching or superintendence. It holds, in fact, an

intermediate position between food and medicine. Whenever doubts have arisen respecting its value, they are attributable to one of three causes:— 1. Sarsaparilla has been improperly prescribed; or, 2. What is more usual, some worthless root or substance has been given as a substitute for it; or, 3. The sarsaparilla used was bad and inert. The English markets and shops abound in *spurious and worthless* sarsaparilla; and preparations are sold professing to be made with it which do not contain a grain of the true root. One reason of this is, the genuine and active root is expensive. . . . Sarsaparilla is, to use the words of Sir W. Fordyce, the *great restorer of appetite, flesh, colour, strength, and vigour*, to constitutions enfeebled or emaciated by early excesses, by acute diseases, or by the use of mercury. Even in the failure of the powers, or premature ageing, arising from wear and tear or over bodily or mental exertion, its restorative power is very great. In many painful diseases, and what are termed bad habits of body, it generally affords complete relief. General as its use has become, it deserves to be far oftener employed, particularly at the age (uncertain as

to date) when youthful activity begins to flag, and the faculties of body or mind are enfeebled, even without the existence of any specific disease to call for it, but as an adjunct to the diet proper to that period of life. Persons who have resided in hot climates, whether they have had recourse to mercury or not, will find sarsaparilla the best means of relieving the lassitude and ennui from which they are apt to suffer.

"When taking a course of sarsaparilla, persons should wear flannel next the skin, and avoid exposure to change of temperature or damp. We recommend, whenever possible, sarsaparilla should be taken in the form of compound decoction, prepared at home. The best Jamaica sarsaparilla only should be purchased; and the smaller and more abounding in small fibres the better. The virtue resides in the bark of the root. When the fibres are removed, half the value of the root is gone. Still, it is necessary to be cautious in the purchase, as it is certain that the roots, after having the greater part of their extractive matter removed by soaking in water and boiling, are dried and sold to be retailed to the public. When

the decoction cannot be made at home, or when required in travelling, the compound decoction concentrated, and especially a hydro-alcoholic concentrated decoction, prepared by a conscientious chemist, may be substituted."

Besides sarsaparilla we have many substances called medicines, which should rather be deemed articles of, or adjuncts to, diet, with no mean powers as restoratives and tonics, and which are capable of materially retarding the changes incident to ageing. These must be selected, combined, and their use directed according to the condition of the individual for whom they are prescribed.

Iron, in some of its combinations, as we have said, enters into and performs very important functions in the natural processes and compounds forming the blood and tissues. Other substances alien to the system, that is not supplying any element in the natural composition of the body, undoubtedly exert a highly genial influence in the debility and disorders of age. An exposition of this subject, however, belongs to a work on the Science of Medicine.

## GOUT.

The place for remarks on this disease is assuredly here, under the more general designation *pain.* A very painful disease it is in its overt state, and few persons suffering from it will fail to have recourse to the Physician. We happily possess medicines able to afford relief. Colchicum in one form or other is almost invariably employed, whether it be in a secret compound, as eau médicinal, eau de Husson, or in the orthodox prescription. Gout, as it exists in an open and acute attack, however, it is not my purpose to speak of beyond a single remark, namely, that as an adjunct to the specific drug, evacuating the bile ducts by a dose of podophyllin is a most beneficial measure.

The reports of the Registrar-General have reversed many a popular maxim, and destroyed illusions respecting diseases. In the last report issued for 1873, gout is found to destroy more lives directly than strong drinks,—the number of deaths from gout exceeding those from delirium tremens; and, indirectly, as the Registrar observes, many deaths referred to other causes are doubtless due to gout.

Mr. Farr, the eminent secretary to the Registrar, applies to gout the designation *diathetic disease;* what is meant is that gout exists in the system for a time in a latent state, as a condition, not necessarily exhibiting any symptom of disease either general or local. "A gouty constitution" is the popular expression for this. Sometimes, indeed, it reveals its presence to an experienced observer by shifting or wandering pains (erratic gout), but these are easily mistaken for pains of a different character, if occurring before an overt attack has been experienced. As is well known, acute disease of a very painful and peculiar kind may show itself in such constitutions at any moment, either altogether spontaneously, or excited by some accidental circumstance. The toes, fingers, or other parts of the feet or hands, are usually the seat of the first attack.

After a first overt attack of gout, we may be *sure* there is the gouty diathesis ; and it is now certain that it is a frequent cause of the premature abridgment of life.

Gout is usually attributed to high feeding and luxury. This is by no means universally true. It

occurs, perhaps, more frequently in persons who have indulged to excess in the pleasures of the table, but the taint may be hereditary, or it may be generated by a low diet, and abstinence carried to extremes.

The question for us here is,—Is there any remedy for the gouty diathesis? A proper regulation of the diet is of course indispensable, and to this is commonly added the free use of alkalies, potass, soda, and lithia, or the alkaline earth magnesia, or the oxide of bismuth. These, either as medicines or in mineral waters, are employed, because in gout there prevails an acid in the system—uric acid, and they serve to neutralize acids. Some slight amelioration, perhaps a prolongation of the intervals between the attacks, attends at first the use of these alkalies, but subsequently, as many medical authors allege, and by their continued action, they aggravate the disease.

There is one vegetable remedy which has a reputation for relieving the gouty constitution from the pervading poison. It was known and employed long ago, but like many other remedies has

slipped from the books of the colleges, and therefore from practice. This was also for a time the fate of colchicum. The value of colchicum as a means of relieving overt gout was known to physicians 200 years ago ; was forgotten, and only came into use again by being made a secret medicine of. Sir H. Halford has the merit of its rediscovery in recent times. In like manner, the winter cherry (*Physalis alkakengi*) is said to be the active ingredient in a patent medicine reputed to obliterate the gouty constitution.

The very name of the winter cherry, as well as its use as a remedy, was forgotten until I gave a brief account of it in "Household Medicine," in 1862. Since then it has been in a few instances employed, and found to deserve its ancient reputation.

To any reader of this book, who has given attention to the recent progress of science, it will be no surprise to learn that there is good reason to hope that a remedy has been discovered which, at no distant period, will reduce the number of deaths from gout very greatly, if it does not entirely obliterate this item from the Registrar's list. How soon it may be recognised and brought into use, it is impossible

to predict. In the year 1800, a great chemist announced the discovery of an anæsthetic, an agent having the power to render the human body insensible to pain under surgical operations, namely, nitrous oxide, or laughing gas. Teeth could be extracted, limbs amputated, without giving the slightest pain. Sixty-eight years elapsed before it was adopted by surgeons. In the meantime other anæsthetics were discovered: ether, chloroform, etc.; but these also were known many years before adoption.

Again, chloral was discovered in 1832, by Liebig; nearly forty years passed ere it was used to procure sleep, for which it is now found to be so valuable.

How long will it be before sarcosine, the substance alluded to, and described by German Physicians, comes into fashion for the cure of gout?

## RHEUMATISM.

Acute rheumatism, or rheumatic fever, a very formidable disease from the amount of suffering it entails, commonly attacks persons at an earlier age than the epoch we are considering. It is very

apt, however, to leave serious damage in the system after its acute symptoms have subsided, which lasts in many cases through a whole life. One of its effects is a tendency to more or less frequent attacks of chronic rheumatism. This may be termed rheumatic diathesis. In whatever it consists, whether a poison is generated, or a change wrought in the tissues by the acute disease, it too often lingers into old age. I have already mentioned that other painful states in elderly people are very commonly confounded with it. Hence the confusion and contradiction we constantly meet with respecting the effect of remedies. If a patient suffering from diffused pains in the muscles, joints, etc., has experienced at some former period of life an attack of rheumatic fever, it affords a presumption that his present pains are rheumatic.

The locality of the pains, when they are partially or wholly localized, helps the diagnosis. What are called the fibrous textures,—the ligaments and coverings of the joints, the sheaths of the muscles,—are the most frequent seat of rheumatic pain. The coats of the nerves, too,

are doubtless sometimes affected, and then the pain closely simulates neuralgia from malaria or other causes.

The treatment of chronic rheumatism, as it attacks elderly people, may be most effectually directed to the locality of the pain. Stimulating and sedative embrocations and fomentations are of much value. Many internal remedies are reported to be useful, and justly so; but they are not discriminated with sufficient accuracy, any more than the distinction between rheumatic and other pains. The general remarks I have ventured to make on pain as inimical to life, and its tendency to abridge its duration, are as much applicable to rheumatic as to any form of pain, from any cause or of any other nature.

## LUMBAGO.

This disease consists of a condition of the muscles of the loins in which any motion is attended with acute pain. It occurs far more frequently in adults while in the full vigour of life than later. It is in many medical works

confounded with rheumatism, but it differs essentially and by very well marked symptoms.

The attack of lumbago is most frequently, especially a first attack, sudden ; an unusual movement, stooping to lift a weight, a fall, a blow, or the like, is followed at once by severe pain in the lumbar region, with inability to move, to walk, to turn in bed, to rise from a sitting posture, to stand in an upright position, without aggravating the suffering. It may go off as suddenly, or continue a few days, or even weeks. It is not attended with fever or disturbance of the natural functions ; it does not even prevent sound and refreshing sleep ; but, on waking, the patient is scarcely able to turn in his bed.

Narcotics are, therefore, not called for. To the ordinary treatment,—mustard and linseed poultices, or hot fomentations to the loins, with a mild aperient,—I can add one item of great use :—

Let the patient resolutely leave his bed, place himself back to an upright wall, and lift himself gradually erect, and then walk about. The process is a painful one, but possible, although the sufferer

is often difficult to persuade, yet when accomplished it is efficient.

### LIMIT TO THE USE OF NARCOTICS.

I would repeat, in order to make the opinion more emphatic, that narcotics should be employed for the most part only as temporary expedients to afford relief from suffering; they are at best but palliatives, and they may obscure the real disease which is causing the pain. The relief they afford should never exclude close investigation and immediate resort to the measures and remedies appropriate to the special disorder discovered to be the source of the suffering.

### THE STOMACH AND DIGESTION.

It has been remarked by writers on medicine, that elderly people are less frequently subject to indigestion than the young and middle-aged; and when this disorder is met with in the latter, it has a different character. This may probably be partly ascribed to greater care in the selection of food, more moderation in the quantity taken,

better arrangement of the time of meals, and the habit of taking more repose after eating than young persons allow, these circumstances being guided by experience.

The appetite is generally more regular, and the action of the stomach upon the food (the first step in digestion) more perfect. I am inclined to regard these facts as indications of a power in the system (*vis medicatrix*) to check the tendency to decay, existing in all its parts—the recuperative power, without which every disorder would run on its course to the destruction of life.

Elderly persons should not take one large meal in the day, as they are apt to do, but make at least three lighter repasts. Sleep after dinner may, to some extent, compensate for the error when committed.

Any degree of oppression after eating should be avoided rather by taking a smaller quantity, and the omission of the less nutritious articles of food, —fish, pastry, potatoes, or other vegetables, even bread,—and making the meal of the more nutritive, rather than seeking relief from stimulants. If, guided by appetite, flesh meats, etc., only or

mainly are taken, and oppression or other symptoms of lack of power in the stomach occur, instead of soda or other alkalies, relief may be sought by a comparatively new remedy supplied by science, namely, *pepsine.* Alkalies should never be indulged in without good advice, and after the conditions of the system generally have received attention; nor should pepsine, without first diminishing the amount of food to a fair quantity of animal substances, flesh meats, poultry, game, etc. It should not be used to force through the stomach a large amount of incongruous matter, more than the system needs.

Every part, however, demands sustenance and reparation, and therefore loss of appetite cannot in aged persons be neglected with impunity. Its cause should be sought and remedies applied, as in all cases of disease, without delay.

## THE LIVER AND LOWER BOWELS.

These organs perform two functions equally important to the maintenance of health. Assimila-

tion of food and extrusion of worn-out and effete matter.

Old people are said to give too much and too exclusive attention to the state of their bowels. This can scarcely be, since a correct action of the liver and lower bowels is essential to health and comfort. Without entering into the physiology of this organ, it is readily understood—(1) That bile in sufficient quantity must be formed; and, (2) That there must be a free channel through which it can flow, to reach the food as it leaves the stomach. In both these respects there is apt to be a partial failure. Either bile is not formed, and its constituents remain in the blood; or from diminished elasticity of the vessels it does not flow through them freely. They remain full; the stools have not the natural colour; and besides this symptom, if the eye is examined, its white coat, the *sclerotic*, is seen to be tinged with a greenish or yellow colour.

This arises from the bile being absorbed and carried into the circulating blood. A very small amount may be thus detected; but when much is diverted from its natural channel, it will be seen in

the urine; and if not diverted from this abnormal course, the skin becomes yellow, and the disease is now termed jaundice. This may arise from obstruction of the gall ducts by mere inspissated bile or from gall stones. For jaundice the aid of the Physician will be sought; but the less obvious forms of this trouble are not unusually neglected.

Other sufferings flow from it—low spirits, melancholy, nervousness, sleeplessness, and often pain, more or less severe, with a sense of weight, in the back of the neck, head, or shoulders. This is another form of pain erroneously called rheumatic.

Formerly the remedy resorted to was mercury in some shape. Blue pill and black draught, so popular from the prescription of the late Mr. Abernethy, was taken in all the various cases and symptoms included in the term "biliousness." This plan it must be admitted, usually affords temporary relief; but all experience testifies the undesirableness of introducing mercurials into the system when they can be avoided; and the inexpediency of frequent doses of black draught.

For the last few years we have happily possessed a substance, derived from the vegetable kingdom, having the remarkable power of acting upon the liver, in doses of varying amounts, stimulating or correcting its action, and evacuating the bile ducts, without any injurious or long abiding consequences.

A single dose of it will afford relief, and clear off the clouds of melancholy or depression of spirits besetting the mind. And when there is no organic disease as the cause of jaundice, it is a speedy and safe remedy for that disorder.

Podophyllin is a resinous extract of the rhizome, or underground stem (in common parlance, *the root*) of the May-apple, *Podophyllum peltatum*,—a plant growing abundantly in many parts of America.

Podophyllin was introduced to the profession in this country by me in "Household Medicine," and in three papers published in the *Lancet*, February 22, March 15, and April 19, 1862. Since then it has been employed very extensively in this country, in India, and indeed all over the world. It has been inserted in the British Pharmacopœia.

Thus I have the great satisfaction of knowing that thousands of sufferers have been and are daily deriving benefit through my efforts, to whom my name is unknown. The quantity of podophyllin now prepared by manufacturers in this country, besides that imported from America, is immense, although the dose is very small, ranging from $\frac{1}{8}$ of a grain to 2 grains. As an alterative and means of evacuating bile, it is unrivalled; and as a consequence, much mental depression and inquietude vanish before it. It acts like a charm often in a single dose. "I would not wish to live," said a sufferer, an old retired medical man, "if I had not podophyllin."

Nevertheless it ought always to be taken, when needed, under skilful advice as to quantity and frequency.

In some cases of liver disorder, taraxacum (*common dandelion*) is very useful. Like sarsaparilla, this plant is rather dietetic than a medicine. Again, in hepatalgia (liver-ache) we have in buck-bean, *Menyanthes trifoliata*, a remedy which is also a general tonic and restorative.

### THE LOWER BOWELS.

A daily easy action of the lower bowels is the best condition of these organs for the maintenance of health. It is rarely that tobacco smokers suffer from constipation, especially if indulged in after breakfast. A little careful attention to diet will generally serve to regulate the action of the bowels. If, in spite of all care, constipation is suffered, an enema of warm water, in which a little soap is dissolved, is the best means of relief. The practice of taking pills, of which the constituents are unknown, and advertisements of which teem in the newspapers, cannot be too strongly reprobated. If you have any regard for your health, and desire to enjoy it permanently, persistently refuse to obtain momentary relief by such means. Very few practitioners would fail, if consulted, to relate many instances of great injury caused by the habitual use of advertised pills. If a person's own efforts do not secure the needed purpose, consult a Physician as to the most suitable aperient for the especial case.

Elderly people often suffer from flatulence.

This usually depends on the food: either too much is taken, or some article which must be abstained from. Leguminous vegetables, peas, beans, lentils, revalenta, as it is called, in most persons produce offensive flatulence. Soups and even beef-tea, will induce it in some persons. When, however, flatulence becomes habitual, and does not cease on change of diet, it indicates a more serious cause, a failure of power in the intestinal canal, and demands a full investigation as to its locality, and energetic remedies for its relief.

## THE KIDNEYS AND URINE.

The removal of waste and effete materials from the system in the way and through the channels appointed by nature, is of equal importance for the preservation of health as nutrition.

A variety of compounds, and salts dissolved in water are separated from the blood by the organs well known as the kidneys. This fluid is the urine.

The bladder is the receptacle for the urine

secreted by the kidneys, where it is retained until it can conveniently be expelled. The office of the bladder, therefore, is mainly mechanical. The knowledge of the formation and properties of the urine, as it proceeds in health and is modified in disease, belongs to a very advanced chemistry.

This science has accomplished much for physiology, but its application to pathology is yet in its infancy. At some future time, it is highly probable important discoveries will be made respecting the renal secretion greatly modifying the duration of life. In the meantime, proceeding on scientific grounds when we can, observation and experience will serve the purpose to a limited extent.

### SIMPLE OVERFLOW OF URINE.

There is scarcely any circumstance premonitory of impending trouble in old people more frequent than this, and other obvious appearances in the urine. Many I have afterwards to notice follow upon the simple increased quantity so closely as to cause this first step to be unnoticed. Hence some Physicians who see cases after they have been neg-

lected, and have made some progress, doubt the existence of this simple overflow.

In a state of health, the amount of urine passed during the twenty-four hours should very nearly correspond with the fluids taken with the food, so as to maintain an equal balance between the loss and supply. Some deviation from this to a limited extent, however, is not inconsistent with health. The quantity passed is usually greater in cold, less in hot weather, obviously because the temperature affects the amount of fluid which transpires through the skin as sensible perspiration.

In advanced life, passing larger quantities of water than is natural often occurs when there is otherwise no such marked deviation from health as to call for medical advice. The bladder fills frequently, and must be emptied—that seems all; but the night's rest is disturbed, and when it increases to a considerable and noticeable extent, the circulating blood becomes thicker, the surface looks dark, the complexion lurid, the muscles and other textures become dryer. Languor, a sense of weariness, even after long repose, and,

on rising from bed stiffness of the limbs will be experienced. There is in some cases much thirst; in others, very little.

I think simple dysuria, as this is called, does not cause thirst. When there is much thirst, some of the changes mentioned in the sequel are beginning.

People wonder where the water comes from. This is no mystery. The greater part of what we call solid food is made up of water. Our own flesh and blood are mostly water.

In health, the water contained in the solids taken as food, termed in science *constitutional* water, nearly balances the amount removed in the processes of organic change in our own flesh and blood. When the latter lose the water necessary to their healthy condition, the other and more solid parts begin to change and decay, *i.e.*, run into disease.

Dysuria, or simple overflow of water, is analogous to diarrhœa. It may be checked and remedied by change of diet and simple remedies.

There is a group termed diuretics—medicines prescribed for the purpose of increasing the flow

of water when it is deficient in quantity. Among these, there are some which act both ways—they increase or diminish the flow, according to the condition of the kidneys, by imparting tone or bracing the fibres of those organs, and so inducing a healthy state, when their function of separating water from the blood is duly performed.

The change of diet should be first, if malt liquors have been taken habitually, they should be left off, and a moderate amount of wine substituted. A glass of port with two meals in the day, and about four ounces of water. If dysuria occurs in a wine drinker, reverse the change, and substitute good stout for the daily wine. If tea or coffee has been the custom, change them, or altogether disuse hot fluids, and take claret and cold water.

Soups and fish should be avoided.

Green vegetables supply certain elements—potash, sulphur, etc.—to the blood and juices, and greatly tend to maintain a healthy condition. In the case before us, the onion tribe are real remedies. Onions, leeks, eschalots, garlic, freely taken, will often arrest the overflow. An onion eaten raw

at night is most efficient. If this is considered too coarse an article for food, the doctor may prescribe squill (one of the same tribe) as physic. I prefer the former. Water-cress, garden-cress, and mustard, in salads, asparagus and the girasole, all act as tonics on the kidneys. Potatoes should be entirely abandoned.

Such are the means the patient may use for himself; but medicine furnishes many more.

This simple inordinate flow of urine which I have described, and which is so readily remedied, often if neglected, issues in, if it does not sometimes begin with something more serious. The urine may be loaded with albumen, *Bright's disease;* or with sugar, *diabetes;* phosphates, *salts which produce irritable bladder* and *stone;* oxalic acid, *oxaluria.* Let us take first,—

### ALBUMINOUS URINE.

Albumen enters into the natural constitution of most of the tissues and organs. While all the processes are healthy, it is transformed into urea, and is thus removed in the urine. When it escapes as albumen through the kidneys, there is

much that is wrong in the system, and serious disease will manifest itself somewhere.

This escape of albumen is seldom observed at its commencement. The redundant flow of urine not being attended with suffering, merely with inconvenience, is allowed to proceed unchecked until much debility is felt, and often until the feet begin to swell. Then the Physician is called in; and if he examines the urine, the mischief is discovered. The way to find albumen is to boil a portion of the urine in a glass tube, or silver spoon, when flakes of coagulated albumen appear. To detect minute quantities, a few drops of nitric acid are added to the urine before boiling.

An aged person passing too much water, and feeling himself growing rapidly weak, may test the urine for himself.

The late Dr. Bright gained great celebrity by examining the kidneys in cases which had proved fatal: he found these organs palpably diseased. The change in the structure of the kidneys was regarded as the cause; they are said to be degenerated; and the complaint is now known as "Bright's disease."

Now, there is no doubt that the alteration in the kidneys is one effect of a general change in the albumen in many or all parts of the body. It is the soluble albumen pervading the lungs, muscles, and tissues generally, which is undergoing a change,—degradation,—an abnormal change, instead of passing into urea. This is proved, first, by the general debility which accompanies the escape of albumen; secondly, by the effusion of water into the tissues—that is, dropsy, its immediate consequence; thirdly, by the nature and action of a remarkable remedy recently discovered.

If, when the outflow of albumen is first detected, there are no serious changes already advanced in any important organ, the disease is amenable to a decided but simple course of diet, which is the remedy alluded to.

Hence the importance of attention to the urine if it be habitually redundant, and the simple means described above have been used, and fail to check it.

A happy thought occurred to a German Physician, when reflecting on the subject of certain

incurable diseases. He conjectured that a great and beneficial change might be wrought in the constitution by complete abstinence from every article of food usually taken by adults, and returning to that on which alone the rapidly-growing body in infancy is fed. He tried it in a variety of cases; and, to his own surprise, he found it strikingly successful in albumenuria, or Bright's disease, in all its stages, even in some where it had brought on dropsy.

This remedy consists in living for a time exclusively on milk; and it has been adopted, with marvellous success, in this country. Pure milk, with the butter, that is, the cream carefully removed,—skimmed milk, in fact. This method of treatment has been called the "milk cure." It has nothing of charlatanry about it. Its action is explicable on the principles of the soundest science. It accords with physiology. Human milk contains very little fatty matter; and skimmed cow's milk closely resembles it. The effect of this returning to the simple nourishment of childhood strikingly and beautifully illustrates the chemistry of the living body.

As Bright's disease is one which certainly and rapidly proves fatal under ordinary circumstances, and, indeed, the idea of its being a hopeless disease in the kidneys tends to its being usually treated only by palliatives, it becomes of great importance, now that an efficacious remedy has been discovered, that it should be used properly, and under skilled superveillance.

## MUDDY URINE AND GRAVEL—ORIGIN AND PREVENTION OF STONE.

In a state of health the urine is a clear transparent fluid, of a straw-colour when passed, and remains so for some time. In many disorders of the system it becomes turbid on cooling, with more or less sediment, with various tints of colour, yellowish or reddish brown.

Now a very important distinction exists, and in elderly persons the due appreciation of it may very often greatly influence the duration of life.

If the sediment and the turbidity disappear, and the urine becomes clear on heating it gently, whilst it indicates febrile or inflammatory action somewhere

in the system, it is in itself of little moment; it will be only temporary. If such urine is continuous, it may direct the patient to consult his physician, to discover what is amiss, and this is the proper course.

If the urine is turbid when first passed, and does not become clear on heating, but rather more thick and muddy, and the sediment is granular, attention must be given to it.

Most people know what gravel is, namely, a sediment in the urine of a red, or dirty white colour, usually attended with pain in the region of the kidneys, and often with pain in the bladder itself on passing water. The early stage of this disorder is very generally neglected. After a time the granular sediment from the urine formed in the bladder produces irritation and acute pain on making water; the small granules then adhere together into little masses which pass with difficulty, often producing an unnatural amount of the secretion of mucus by the bladder itself, which agglutinates them into larger masses, and forms *stones*. This is the history of most cases of stone. Futile, because misdirected, efforts, and palliative and

useless medicines and measures, are pursued until the dreadful and dangerous operation of cutting for or crushing the stone to remove it becomes the common resort. It was thus that the life of Napoleon the Third was brought to a premature close, and it is the fate of thousands. I fear it is not wholly without foundation that the profession are charged with preferring great and brilliant operations to the careful study of causes and the adoption of preventive remedies. But it must not be forgotten that the patient's own neglect, in leaving unnoticed the early symptoms, exonerates the physician who finds at the first consultation the disease far advanced.

Now the thick muddy urine and the resulting gravel and stone occur in two states of the general system, which require to be carefully distinguished before remedial measures are resorted to.

It is in the general system somewhere that the mischief begins. The materials of the deposit are abnormal products, either of faulty digestion or assimilation of the food, or of agencies affecting and misdirecting the changes in the elementary matters to fit them for expulsion (secretion). The

discussion of all this belongs to a medical treatise, but a few simple words will render it clear. Indulgence in high living, superabundant animal food, rich dishes, various wines, etc., with deficient exercise, impure air, and errors of regimen of various kinds, set these morbid changes going. The blood and flesh juices become deteriorated. As the kidneys form the channel through which impurities are to escape, their secretion is made unnatural; and in the kidneys themselves (*i.e.*, in a little pouch which first receives the urine), the sediment agglutinates into masses forming stones.

What is to be done to prevent the evils thus arising? First, ascertain whether the urine is acid or akaline. This is effected by small slips of prepared paper—test papers,—obtained of any chemist; drop a blue paper into the recently passed urine; if it turns red, there is acid,—a red paper becomes blue—the urine is alkaline. Secondly, adapt the diet to the circumstances. In the first case, abandon acid wines (all wines in fact are more or less acid, so are most spirits, brandy for example); lessen the proportion of animal food, and increase the farinaceous and vegetable. In the

second case, reverse the order and manner of the change.

This change of diet is a valuable adjunct to the treatment. A recent and most interesting discovery is now to be explained, as it exactly falls in with the design of this work.

With muddy urine, gravel (whether uric acid or phosphates), and incipient stone, there is often pain, irritable bladder, and other troubles. Opium, in one of its numerous forms, and a whole string of narcotics are employed as palliatives; and for ease a hundred nostrums are recommended, and everybody (more especially those who are entirely ignorant) has some infallible remedy. Mineral waters are favourites, and many of them certainly do this—they expedite the crisis of the disease, and complete the formation of the stone. The Emperor may almost be said to have fallen a victim to Vichy water.

As regards the pain, opiates are incomparably the best medicine for relieving it.

But the great remedy, which I have termed a discovery, is the substitution of *pure distilled water* for all other water, whether in soup, tea,

coffee, or other mixtures, and its free use as a beverage. I wish I knew to whom to give the credit of this discovery. It is precisely in the line of the highest science.

All water from natural sources contains more or less saline matter; lime and magnesia salts being invariably present. Generally, these constituents are not unwholesome. They give to water its agreeable taste, especially when accompanied with free carbonic acid; and when the system is in health they supply needful ingredients to the blood. In the condition we are speaking of, the minutest quantities of these salts added to those already present in too large a proportion, determines the formation of those compounds which go into the urine, and form stones.

It is an odd thing that the very means which science teaches are the most likely to aggravate the disease, are precisely those most frequently recommended for its relief.

No one who has studied the properties of water in its pure state, and when containing small quantities of salts, or even atmospheric air, will be surprised to hear of its effects when so far pure

as distilled water, on the constitution, and on stone in the kidneys or bladder. One fact, popularly known, may be mentioned in illustration. Pure distilled water will act on—*i.e.*, dissolve—metallic lead; whereas the presence of minute quantities of the salts, which render it, as we say, *hard*, will effectually prevent this action.

In the earliest possible stage of the disease we are speaking of—turbid phosphatic urine, or gravel,—distilled water should be at once adopted.

Even when stone exists, it has great power. Dr. Murray, of Newcastle, tells us that in the Infirmary there, it is quite common for patients treated with distilled water, to pass water-worn stones, *i.e.*, they have been so far dissolved as to be rendered small enough to pass through the external passage (*i.e.*, the urethra).

The constitutional treatment by drugs in these cases must be left to the physician.

### DIABETES, OR SWEET WATER.

This disease consists of an abnormal flow of water laden with sugar. The detection of sugar

in the urine must be the work of a chemist. Redundant, limpid urine, great thirst, and loss of flesh, occurring together, will afford good reason to suspect the presence of sugar. Often it is detected by spots on the trowsers, which are minute crystals of sugar left where drops of urine have splashed.

This curious disease, which consists in the food first, and afterwards the constituents of the body itself, being transformed into sugar, is surely fatal unless checked by proper remedies. This transformation is explained by chemistry; but why it begins and proceeds in the living body is the main question. The subject is too scientific and complex to be fully treated here. The usual method adopted to arrest it, consists in an attempt to exclude from the diet all saccharine substances, and those which are readily transformed into sugar. The patient is prohibited from taking any form of starch — even bread—and is put on bran biscuits, or gluten, the staminal principle of wheat, from which all the starch has been separated. This plan diminishes for a time the amount of sugar in the urine, but fails

to cure the disease. It is, in fact, a clumsy expedient, like an attempt to render a stream pellucid which is turbid at its source.

We can transform starches and other similar substances into sugar in the laboratory, but to do this we must have recourse to an agent termed a *ferment.* This is a nitrogenous compound in a state of active change (decomposition or decay). Now, in the body nearly everything is a compound of nitrogen,—the substance of the muscles, the blood, etc.; and these in health, as we have before remarked, when used up and become effete, are transformed into urea, and pass off in the urine. In the urine there is a ferment, and after it has left the body this ferment causes the urea to be transformed into ammonia, carbonic acid, and water. That is the natural course of things.

In diabetes a nitrogenous ferment acts in the body as it does out of the body, *i.e.*, transforms amylaceous substances first, then the fat, afterwards other elements, into sugar, and other complementary compounds.

It is to the detection and exclusion of this

ferment we must address our measures of treatment if we would cure diabetes.

## THE THROAT—AIR PASSAGES—LUNGS.

### *Catarrh—Influenza—Bronchitis.*

Bronchitis is one of the most formidable and fatal diseases occurring in advanced age.

It seldom comes, however, in its severest form on a first attack. Generally a susceptibility to a renewal and repetition remains when once suffered. Its most prominent symptom, *cough*, occurs in every degree. More or less irritation of the mucous membrane of the nose cavities, throat, and air-passages, termed *catarrh*, very often precedes the inflammatory state of the lining of the bronchia, constituting the disease.

What is its cause? What gives the susceptibility to it? How can it be guarded against? How arrested? There is a constant current of atmospheric air flowing through the nostrils, the nasal cavities, the glottis, or opening situate at the root of the tongue, into the bronchia, or air-passages—the upper part of which is called the larynx. This

air, as we breathe, spreads through the lungs in the minute divisions of the bronchial tubes—it is so inspired hot, cold, temperate, moist, dry, pure, or contaminated. The popular name for catarrh is "a cold,"—catching a cold. This is the basis of the theory of catarrh and bronchitis originating in cold air or changeable weather, variations in the hygrometric state of the atmosphere, or exposure to cold currents when the body is heated.

There is much truth in this theory; but something more is needed to explain attacks of catarrh, especially in its more intense form, as influenza—when the catarrh is certainly contagious and often epidemic. During the prevalence of such catarrhs, the most fatal attacks of bronchitis are met with. The atmosphere, at certain times, is a vehicle for some subtle poison, gaseous vapours, or it may be minute solid matter, not yet detected—the most energetic, if not the only, cause of catarrh and bronchitis. How often do we hear patients say, "I cannot think how I got this bad cold," there being no exposure or any circumstance to which it can be referred.

However this may be, it is invariably recognised

that some persons are more susceptible of these attacks than others, and the practical question is how may this susceptibly be remedied. The morbid impression on the mucous membrane, leading to catarrh, cough, etc., is sometimes first felt locally in the nose, and as the membrane is continuous, it passes on and downward to the bronchia. If we can harden, so to speak, the membrane, we render the attack less likely.

1. Habitual smokers are, as a rule, less susceptible to attacks of catarrh and bronchitis than those who do not smoke.

2. The habitual use of cold water, simply, or with the addition of a teaspoonful of common table salt to half-a-pint of water, as a gargle to the throat, is very useful.

3. An astringent gargle used freely night and morning.

4. Friction over the throat externally with a rough towel wetted with cold water once or twice daily.

When the attack begins—*i.e.*, the cold is caught—it may be arrested in the nasal cavities, or at the upper part of the air-passages by applying freely

the vapour of pure ether. Inspiring it by the nostrils from a small wide-mouthed phial, and expiring it through the mouth; or the contrary way, when the glottis is first struck. This proceeding cannot be extolled too highly; it is very efficacious. And even when cough is established, or the lower bronchia affected, it will afford the most speedy and safe relief.

The means recommended for treating cough are innumerable. Little or no discrimination is exercised, and hundreds of lives fall victims to misapplied remedies.

At first, when bronchitis of a sharper kind comes on, the fluid poured out by the membrane and coughed up is fluid and frothy. The use of opiates and other medicines to arrest it in this stage is attended with great danger. In fact, the physician only should guide the treatment.

When the secretion becomes thick and slimy, opiates are, and will be, used. But if the specific action of the Thapsus verbascum (*mullein*) were known, it would be universally substituted.

Chronic cough in aged persons, with expectora-

tion of much mucus, must be cautiously dealt with, as all judicious writers testify; but the beneficial influence of thapsus, internally or when smoked, is not known, or it would be had recourse to more frequently. The use of opiates should be locally, and in very minute quantity. It is a clumsy and dangerous way of arresting a cough in aged persons to give them doses of opium, laudanum, or morphia, so large as to affect the local trouble only through the brain.

There is one domestic remedy which cannot be too highly extolled, inasmuch as it never does harm, is easily applicable, and confers great benefit, even often to the extent of effecting a perfect cure: and it is equally useful in the earliest stage of bronchitis as in old chronic cases. I mean the inhalation of the vapour of water heated to near boiling. If no instrument is at hand, a narrow-mouthed jug may be used. The vapour breathed in through the mouth, and expelled through the nostrils. It is best done when the patient is in bed, and continued for fifteen or twenty minutes. The hot vapour soothes the membrane, removes the secretions, and allays irritation, and thus gene-

rally gives a night's rest from the cough. See note on apparatus.

### THE HEART.

This is one of the most important organs of the whole body. Its structure appears at first sight to be very complicated ; but its functions being entirely mechanical, it is readily understood. The heart is a double force-pump, having two receptacles appended to it, and being provided with valves to direct the course of the fluid (the blood) on which it acts. Its cavities are hollow muscles, by the contraction of which the blood is moved, and its circulation throughout the whole body effected. These cavities contract in succession. One receives the blood through the vessels from all parts of the body. These vessels are the veins. It passes it into another, which throws or injects it through the lungs, whence it returns into a third cavity. From this it passes into a fourth (the most powerful of all), which forces it again through the arteries into every part of the body. This constitutes the circulation of the blood, for the discovery of which Harvey is so celebrated.

By slightly compressing any artery with the finger, we feel the jets of the current: this is the pulse. In health, the action of the several parts of the heart are regular, rythmical, and produce pulsations numbering from fifty to eighty or ninety in a minute. The pulse is quickest in childhood, gradually becoming slower in adult life, and is slowest in old age. Of course, I mean in a state of health.

Excitement of any kind, mental emotions, fever, inflammation, and other disorders, render the pulse more frequent than natural. Some diseases, particularly of the brain, cause it to beat more slowly.

There are many other qualities of the pulse besides its speed which we notice, corresponding to, and significant of, changes in the action of the heart. Thus we have a hard and a soft pulse, full and small, irregular, intermittent, fluttering, etc. Moreover, we are able by the ear, aided by the stethoscope, to ascertain the state of the heart at any time.

It is one of the marvels of our nature that the action of the heart and the consequent circu-

lation of the blood can go on, without material interruption, for one hundred years or more.

In advanced life disorders and diseases of the heart are but little more frequent than in earlier periods. Many of them are, to a great extent, under control and remediable. There is no reason for the commonly-entertained apprehensions when an elderly person is said to have a disease of the heart, unless such disease is organic—that is, has become much altered in its structure.

The heart derives its motive power, like every other organ, from the nerves—not those proceeding directly from the brain and spinal chord, but from a system of nerves termed the great sympathetic. The parts and organs supplied with nerve-force from this system are in a measure cut off from the centres of ordinary sensation, so that we have no consciousness of their actions, and no power over them through the will. In health, we do not know, or at least do not feel, that we have such parts as a heart, a liver, a stomach, etc.; but all these parts being linked together by the same source of power, disorder in one will often, more or less, disturb the others.

Hence irregular action, palpitation, fluttering, a feeling of indefinable uneasiness in the heart, may any of them be caused by disturbance of the stomach, or bowels, or liver; and they disappear when the primary trouble is relieved.

Sometimes, however, the disordered action of the heart, once excited, goes on after the exciting cause is removed; and I believe these functional disorders thus give rise to real organic disease particularly to enlargement of the organ (hypertrophy), if neglected.

What I would impress on my readers is, not to assume, because they are said to have a weak or diseased heart, their case is out of the reach of remedies. It is true, the line of distinction between permanent organic changes and functional disturbance requires much skill to determine. The latter are of far more frequent occurrence; and we possess remedies of a very remarkable power over the actions of the heart. Nervines and antispasmodics in a marked manner calm down palpitations, flutterings, etc., when temporary. Digitalis has long been known to possess the power of reducing the frequency of the pulse; but a plant

of recent introduction to English practice from the Eclectics of America, the *Veratrum viride,* possesses this power in a most remarkable degree. It demands great care in its administration; but by giving small, frequently-repeated doses, we can reduce the number of beats of the pulse ten, fifteen, or twenty in the minute in the course of an hour or two.

I have known persons having for many years been supposed to suffer from heart disease, attain to a good old age.

When the action of the heart is so far disturbed as to excite attention, there is usually mental depression; and when it proceeds far, an anxious look is perceptible on the countenance.

Rheumatism affects the heart; and one of the worst features of this disease, in its acute form, is a tendency to attack and damage the heart. I consider the veratrum viride one of the most valuable remedies we possess, inasmuch as its judicious use is remedial in such cases. It not only reduces the frequency of the heart's contractions, but it imparts tone and strength to the organ.

## THE BRAIN—MIND—MOTIVE POWER.

*Mind—Emotions—Paralysis—Sleep.*

It is unnecessary to enter into elaborate or scientific discussion, or even to refer to disputed questions, respecting the brain and its relations to mind. The popular recognition of the brain as the organ of thought, of feeling, and source of all motion, and controller of all the functions of the body is sufficient for our present purpose ; yet two or three facts may be stated to render the following intelligible :—1. As the source of motion and power, the seat of all the senses, the energy of the brain passes outward and downward to all parts. 2. A reflex action passes from all parts to the brain through the nerves. 3. Injuries to any organ affect the brain, either through the nervous system or through the blood.

The brain has the most delicate structure of any part of the body. It requires nourishment, and undergoes waste from use and action, like every other part. Disturbance within it may manifest itself in a great variety of ways—in the mental acts, in the moral sentiments and feelings, in the

nerves as disordered feeling and pain, as diminished power of motion in the muscles—loss of power (paralysis), spasmodic or morbid motions, and in the perversion or suppression of organic action. Bearing these facts in mind the first traces of morbid changes in the brain occurring in elderly persons may be recognised and understood.

If the work of the brain and consequent waste of its substance is inordinate, and the supply of suitable matter for its repair and sustenance fails, disease necessarily ensues. An overworked brain is a common and very significant phrase. Deep thought long continued, care and anxiety in business, study too closely pursued, involve overwork, and frequently induce mischief in the brain. Excitement from any cause, profound emotion, eager pursuit of objects of ambition, lead to more and more continuous action than the texture of the brain can bear. And there are many ways in which disorder in this organ shows itself.

Headache, sleeplessness, failure of memory, of the power of continuous application to some work of thought, illusions (some idea being intrusive, and

if not expelled, becoming dominant), confused dreams, irascibility of temper,—these are morbid symptoms of brain overworked.

Not unfrequently morbid feelings in the fingers, twitchings of the muscles, diminished power proceeding to absolute paralysis in some locality, or sudden and extensive paralysis, occur.

These all, or any of them, indicate disorder of brain, and demand immediate and skilful attention. Any muscle in the body may be the seat of paralysis, partial or complete: for instance, the tongue, producing thickness, or difficulty of speech; the eyelids, causing them to droop; the muscles of the face, generally on one side, making the mouth to turn awry.

When any of these symptoms occur, especially those of the mind, it is common to hear them attributed to *softening* of the brain. Now this is for the most part a guess at the underlying cause; the hypothesis is harmless if it does not lead to erroneous practice. A closer and more accurate explanation is that the brain has suffered waste beyond the amount of nutrition it has received or can appropriate for its repair and sustenance.

This explanation provides the key to the treatment required for its relief.

Any treatment will be faulty and inadequate which does not demand as the very first item complete repose. The brain must be allowed to rest; every pursuit demanding thought abandoned, —business, ambition, study, work, suspended; a careful investigation of the patient's state instituted; the digestive organs, the process of assimilation, first of all, the patient's habits and mode of life, etc., and, if any defect or error is discoverable, it must be corrected and remedied.

It is very seldom that some fault will not be discovered in the primary processes (digestion, etc.).

The secretions, too, must be watched to discover any defect in them. If the liver is not making healthy bile, or in sufficient quantity, if the kidneys partially fail in their office, the defect leaves the blood impure, loaded with foreign, or effete matter, and carrying into the delicate textures of the brain, instead of healthy nourishment, substances poisonous and incapable of supporting and restoring its power and functions. This is the true theory and explanation of over-worked

brain, the root and cause of paralysis, disordered mind, and perverted moral affections, or temper.

Sometimes the incipient disorder of the brain manifests itself by signs in the organs of the senses, impaired vision, clouds or black spots appear indicating partial loss of sensitiveness in the retina (the immediate seat of sight), singing or buzzing in the ears or deafness, bad and persistent smells or false taste, neuralgia, keen pains running along the course of nerves particularly of the face. These all have the same root and proximate cause although referable to different parts of the brain.

There are, however, many head troubles of a more ephemeral character which every elderly person should know and avoid.

Indigestible articles of food will produce headache, sometimes over one brow, sometimes diffused over the head. In some persons badly refined spirits, brandy, or others, having fusel oil remaining in them,—not to speak of adulterations in spirits, or wines,—will produce headache, and their influence will often long outlast the presence of the cause inducing them.

The lower bowels being sluggish, acids are generated by the decomposition of the food, or excretions. This is a very common cause of dizziness, giddiness, and headache. I have known old people being in constant dread of apoplexy, or paralysis, at once disburthened of the fears and suffering, from this cause being recognised and remedied.

When the kidneys do not separate the effete salts and metamorphosed nitrogenous tissues, as urea, freely enough, from debility or other change, the blood becomes poisoned, head troubles are experienced; sleepiness, drowsiness at all times will follow; and if the urine wholly fails to be formed and expelled, coma and death will ensue.

Hence the importance of attention to the urine, as to its quantity and quality.

Men of business, in the eager pursuit of what they regard as imperative duties, studious men, in short all persons who work with the brain more than the muscles, are peculiarly liable to suffer from head troubles. They are apt to disregard the early symptoms of mischief, deeming them trifling and as having no meaning.

Numbness of a finger, dizziness, broken sleep, diminished power of attention, failing memory, and the other symptoms enumerated above, — any of these or similar occurrences should at once lead to relaxation from business at least, if not entire change of scene and habits, and complete mental repose.

Admitting the correctness of the opinion popularly held by the profession of a softening of the brain, this is by no means unamenable to remedies. Besides the change of diet, scene, and habits, spoken of above, we have valuable and efficient remedies, — too powerful, however, too nice in their application, to be entrusted to unskilled hands. The most we can say to our readers is, do not allow scepticism as to the value of such means, or mere procrastination, deprive you of the benefit they can confer. Do not surrender yourselves to the deceptive and mercenary statements of empirics.

One point, however, may properly be remarked further: if sleeplessness is the foremost symptom, be very cautious and chary in the use of narcotics. None of these, not even the new one, chloral,

do more than afford temporary relief. They benumb the over sensitive fibres, suppress feeling, but rather tend to increase the disease, if used to the neglect of more radical remedies.

Wholesome and refreshing sleep may be, in almost all cases, secured without recourse to narcotics. A new method of procuring sleep at will is described in "Household Medicine," worthy the notice and adoption of all elderly people.

Its principle may be stated generally as demanding an easy posture of the body in bed, and a determined direction of the thoughts to some subject as remote as possible from the ordinary and habitual currents, or one which can be entertained without the least admixture of emotions of a disagreeable character. Happy and calm will be the sleep of those who, on their pillow, can muse on the consolations of the gospel, and resign themselves implicitly and without wavering into the keeping of a heavenly Protector and Father.

ESTABLISHED FACTS RELATING TO LONGEVITY.

While the preceding sheets were passing through the press I became acquainted with a volume entitled "Human Longevity, its Facts and its Fictions," by W. J. Thoms, Esq. (the esteemed editor of "Notes and Queries"). Mr. Thoms seems to have shared Sir G. Cornwall Lewis's doubts of the probability of human life extending beyond 100 years. This work is the narrative of his researches into the evidence in proof of published cases of longevity, as they have appeared in the journals. With great pains, labour, and sagacity, Mr. Thoms has pursued the subject for many years. The result he has stated with great candour, although contrary to the opinion he started with. If the same patient and sagacious inquiries could be instituted to determine questions arising in the science of medicine, the same candour in accepting and making known the results, it would be of incalculable profit to mankind, and serve in no small degree to preserve and extend human life. Were the evidence for supposed facts in history similarly dealt with, it would change the entire aspect of the past.

Indeed it would be difficult to find any subject, whether belonging to science, morals, or politics, which would not be benefited and enlarged by being so treated.

After thoroughly sifting the evidence, Mr. Thoms admits that he has found four well-established modern instances of persons living beyond 100 years. They are as follows :—

Mrs. Williams, of Bridehead, Dorset, died Oct. 8, 1841, within one month of 102 years.

Mr. William Plank died at Harrow, Nov. 19, 1867, aged 100 years and 12 days.

Mr. Jacob William Leming died June 23, 1870, aged 103 years, one month, and four days.

Mrs. Catherine Duncombe Shafto, of Whitworth Park, died March 10, 1872, aged 101 years, one month, and nine days.

Mr. Thoms's most interesting and valuable contributions to the statistics of human life contains besides the history of several persons of great age, but respecting whom the evidence in support of the precise number of years claimed for them is doubtful. Among these is one female said to have lived to the age of 106.

I am gratified to find Mr. Thoms's agreeing with me in my estimate of M. Flourens' theory, and adding the great authority of Richard Owen as supporting it. Sir Henry Holland thought himself justified in rejecting it.

It is satisfactory to know that Mr. Thoms is still pursuing his inquiries; but I share in his surprise that the Insurance Companies, with their enormous accumulations of wealth, have taken no combined action to determine the question, "What is the extreme duration of human life?" seeing that they must be directly interested in ascertaining the truth.

Since the publication of his book Mr. Thoms has published another instance of a female who reached her 102nd year. This was a Mrs. Monro, who died in the Almshouses of the Goldsmiths' Company. (See *Times*, Nov. 7, 1873.)

One fact clearly established by Mr. Thoms I must notice, since it has an important bearing on my aim and subject: namely, that the popular idea of longevity being more frequent among the poorer than the rich or middle classes (their relative numbers considered) is a fallacy. Like many popular opinions it vanishes before statistics.

## DISEASES WHICH TERMINATE LIFE AT AND AFTER 60.

A table drawn from the returns of the Registrar-General of the causes of death in 1000 cases gives us, in round numbers, the following :—

| | | |
|---|---|---|
| 1. | Old age . . . . . | about 280 |
| 2. | Diseases of the lungs and air passages . . | 250 |
| 3. | „ of the digestive organs and bowels . | 100 |
| 4. | „ of the brain and nervous system . . | 130 |
| 5. | „ of the heart and blood vessels . . | 60 |
| 6. | „ of the general system—fever, erysipelas, gout, rheumatism, etc. . . | 180 |

As I have already had occasion to remark, we must not place implicit reliance on the registration of deaths. If this is liable to error respecting the ages of persons recorded, it is much more so in the causes of death. It is more than probable that a careful scrutiny would greatly lessen the number (appearing here to be one-fourth of the whole) of those dying of old age. Diseases of various kinds, neglected at the beginning, lose their characteristic features; and when the Physician is called in he finds only the debility or prostration they have

left. It is hopeless to attempt learning from unprofessional bystanders or nurses what has gone on before, and he finds it necessary to certify that the person died of old age. Again, although the medical attendant is required to state in his certificate, not merely the immediate cause of death, but previous disorders, and the length of time they had existed, this is very imperfectly done, still more uncertainty attaching to the information he receives upon this point.

So far as the register points to external agencies as causes of fatal diseases, we may learn from it to avoid them, but it is evident that it throws no light on those numerous and oft unnoticed changes in the constitution of aged persons, which slowly and insidiously lead to overt disease, or to the debility and collapse recorded as old age.

My aim in these pages has been to specify and describe the very earliest indications of those changes, and to point out the measures they demand if we would prolong life to its normal extent.

After middle life we should watch carefully, but without anxiety or fear, our own condition, and

take resolutely the proper steps to stay the first signs of mischief, neither neglecting the aid of medicine, nor employing it without good reason. There is a golden mean between scepticism and blind credulity.

If wisdom is ever to be attained, or common sense to rule the conduct, it is surely when life has extended beyond threescore years.

## SUMMARY.

The views advanced in the preceding pages may be briefly summarized.

Ageing is a result of the operation of several concurring causes. Mere lapse of time will produce it. But ageing does not synchronize with age—that is, with the number of years a life has continued. In some persons it begins earlier and in others later.

Ageing consists in molecular changes proceeding in all the textures and organs of the body, involving a deterioration, degradation, or a species of decay. It may exist without suffering, or consciousness of the change. A person may say,

and truly, "I am quite well for an old man, or an old woman." The qualification implies that there is some degree of weakness, some departure of power formerly enjoyed, and the tendency is daily toward more and more debility.

We have shown it to be indisputable that certain appreciable conditions surrounding individuals change and retard the process of ageing, and thus prolong life. See *ante*, p. 8. These conditions, for the most part, seem to reach individuals fortuitously. If they are sought, studied, employed, why should not very many, instead of, as at present, very few, persons reap the benefit they confer, and attain to a good old age?

Nay; why should we not be able to augment the force of these conditions, and apply the resources of science to the same end,—the arrest or retarding of ageing—and thus not merely increase the number of octogenarians, but extend human life to its utmost limit—100 years or beyond?

This should at least be the aim of our efforts.

A close and careful consideration of the powers

and properties of substances known to act remedially on the body warrants the inference that the molecular action and changes of ageing are as amenable to their influence as any disease whatever. Experience alone, guided by so much physiology as will help us, must determine this.

There is another point of view in which we have somewhat fully regarded ageing, namely, it does not usually—or we should say, most commonly—proceed in all parts and organs alike, or within the same time. One part or organ ages (so to speak) before the others. Hence, elderly persons desirous of attaining longevity, and not unwilling to take some trouble in the matter, must learn for themselves the appearances, or symptoms of change in the more important, or vital organs at the very earliest moment, and take measures to remedy them; or they must incur the expense of employing a Physician to watch over them for the purpose.

They ought not to wait for suffering, or to postpone the search for relief. The health of every part is essential to the health of the whole; and the older we become the more certain is

disturbance in one vital organ to bring a fatal end to the whole, if neglected.

I do not hesitate to make this assertion, although Sir Henry Holland, in his essay on Old Age, expresses the contrary opinion. He says the sympathy between the several parts of the body and their influence on each other diminish with age. This does not accord with my observation. For instance, an indiscreet and heavy meal will sometimes produce a sudden collapse of power in the brain, before any of the food can have been digested. And again, intense headache will often disappear instantly on the use of an enema to empty the lower bowels.

These are results of sympathy; many such are observable in elderly people. I mention them to enforce the foregoing advice.

### AN EXPERIMENT PROPOSED.

When Lady Mary Wortley Montague brought to England a report that in the East a practice prevailed of protecting persons from the worst evils of small-pox, by inoculation, public attention and interest was at once aroused. After

some discussion, the Government consented to allow the operation to be performed on a number of condemned criminals, who on these easy terms saved their lives. The next persons experimented upon were the King's own children. And the practice, being found efficient, was very generally adopted, and prevailed until the safer and more efficacious preventive, vaccination, was discovered.

We would suggest an imitation of the above proceeding, not indeed by experimenting on criminals, but on persons either selected from among the inmates of unions, or others, as might be found most expedient.

Let a certain number of men and women, say ten or twelve of each, of nearly the same age, sixty-five or seventy, be placed in the most favourable circumstances for the preservation of health and securing longevity. Let them be placed under careful and strict supervision; protected against all known external agencies capable of causing disease; supplied with clothing; allowed exercise, and a table well furnished with every necessary and wholesome food. And let them be subjected to the use of all means available for promoting longevity.

It would be necessary in selecting subjects for this experiment, to adopt none in whom any disease could be traced. Their history and antecedents, and as far as possible those of their parents and ancestors, should be ascertained and noted. The aim and purpose in view should be clearly explained and intelligently apprehended by them all, in order that no waywardness or indocility should mar the result. It is this which would render observations pursued with wealthy and independent persons inconclusive. They will indulge in injurious habits and practices, and expose themselves unnecessarily to the attacks of disease.

Now this may appear to many readers a somewhat wild and impracticable suggestion; but I believe it could be effected. The only requisite being the necessary funds. But when we consider the enormous wealth of many people in England, their readiness to subscribe to hospitals and other charitable institutions, it does not appear to be impossible that such an experiment should be made. And I may add my own expectation would be, that many if not most of the patients would have their lives extended to upwards of a hundred years.

# NOTES.

## Note A.

### LONGEVITY OF THE PATRIARCHS, AND IN ANCIENT TIMES.

The remarks in the text do not of course apply to the cases of extraordinary longevity recorded in the Old Testament Scriptures. Before the flood, men are said to have lived five and even nine hundred years; and, as a physiologist, I can assert positively that there is no fact reached by science to contradict or render this improbable. It is more difficult, on scientific grounds, to explain why men die at all, than to believe in the duration of life for one thousand years. The expression (Gen. vi. 4), "his days shall be one hundred and twenty years," has been thought to mean that this should be the extreme duration of life, others think it meant the average. Judging of the meaning by subsequent facts, the latter appears to be the correct interpretation. Of the instances recorded, two explanations are admissible:—1st. They were miraculous; or, 2nd. The duration of human life may vary in the lapse of ages. We have many indications that this really occurs. Abraham lived one hundred and sixty five years. Joshua, five hundred years later, is repeatedly called very old. He died at one hundred and ten. An inscription on an Egyptian monument states the extreme duration of life in that country to be 110. This was the age of Joseph. The coincidence is remarkable.

In the time of David, a man of eighty was regarded as very old. The great Prophet King himself reached only seventy-five. In the 90th Psalm, by all critics attributed to Moses, it is said, verse 10, "The days of our years are three score years and ten, and if by reason of strength they be fourscore years, yet is their strength labour and sorrow." If we admit the meaning of this to be that at and after the time of Moses the *average* duration of human life was seventy, we are in accord with science and history. At the period of the Roman Empire, the average duration of life was very low. We have no precise data respecting it in the middle ages; but indications are not few that it then touched its lowest ebb. We are, however, now sure that the average has, in modern times, greatly increased. Whether the extreme limit of life has fluctuated or not, we do not know. The average has certainly changed, perhaps alternately advancing and declining. It is obvious that the average may increase either by fewer persons dying young, or more living long. We might, *à priori*, have expected that in the lapse of time since the creation of Man, the decline in the vigour and duration of life would have been uniform; but it is not so, and in this lies the ground and encouragement for our endeavours to ameliorate the condition of humanity by promoting the enjoyment of longevity.

## Note B.

*On Human Longevity and the amount of Life upon the Globe. By P. Flourens, Secretary to the Academy of Sciences, Paris. Translated by Charles Martel.* 8*vo. Ballière.*

This volume, containing Flourens' theory described in the

text, is somewhat loose and discursive. What there is of nterest in it is comprised in a few sentences,—

"This question," he says, *i.e.*, the normal duration of human life, "may be treated in two ways, as Haller and Buffon have done,—historically or physiologically. They sought historically what the natural, ordinary, and normal term of the life of man is, and they placed it between ninety and a hundred years. They afterwards sought, still historically, to learn what is the extreme limit of human life, and Haller has placed it at a little less than two centuries.

"Haller collected a thousand cases of longevity, accepting the popular stories. He thought the case of Old Parr, said to have died at the age of one hundred and fifty-two, proved by the fact of Harvey having dissected his body; but this we know proves nothing. Harvey, as to Parr's age, only reports what he had been told.

"Buffon suggested that the total duration of life might be measured by the period of growth. He failed to ascertain the length of this period.

"I find the sign which indicates the term of growth," says Flourens, "in the union of the bones with their epiphyses (soft extremities). As long as the bones are not united to their epiphyses, the animal grows; when once they are united, the animal grows no more.

"In man, the union of the bones and the epiphyses is effected at twenty years of age.

| | | | Duration of Life |
|---|---|---|---|
| "In the camel it takes place at | 8 years. | | about, 40 |
| „ horse | „ | 5 „ . . . | 25 |
| „ ox | „ | 4 „ . . . | 20 |
| „ dog | „ | 3 „ . | 10 to 12 |
| „ cat | „ | 18 months. | 9 to 10 |

"Buffon says every animal lives six or seven times as long

as the period of its growth. He was near the truth. The true relation is five, or very nearly.

"Man being twenty years growing, lives five times twenty; that is to say, one hundred years."

Flourens confines his observations to the mammalia. But in order, as it would seem, to reconcile his conclusions with Haller's assumed historical facts, he proceeds to say, that extraordinary life may go on to double ordinary life. That a century of ordinary life, and almost a second century, half a century at least, of extraordinary life, is the prospect science holds out to man.

We adopt the opinion in the text, that the historical evidence up to the present time fails in proof of any person's having reached even one hundred and five years.

## Note C.

### POPULAR ERRORS RESPECTING LONGEVITY.

Sir Henry Holland, whose recent decease has given great currency to his writings at the present time, has in an essay on longevity the following passage :—

"We have sufficient proof of the frequent prolongation of human life to periods of 110 to 130 or 140 years ; cases which thus authenticated we must take into view when dealing with the question of human longevity."

Mr. Thoms quotes this passage, and remarks that any evidence which can be produced of any human being having attained the age, not of 130 or 140, but of 110 years, will be found upon examination to be perfectly worthless.

Sir Henry Holland had no reliable evidence whatever to produce, he merely expressed a popular belief. The newspapers, and even the medical press, are constantly

inserting accounts of persons dying at fabulous ages, without the slightest inquiry or proof; and Mr. Thoms rebukes what he calls the childlike faith of men eminent in the medical profession in accepting such stories as true, while they ostentatiously proclaim their scepticism respecting the origin of man, and other well-established facts. This disposition to embrace and hold fast sensational errors, and to reject simple truth, is not confined to medical men.

We cannot, however, be surprised at finding popular opinion formed and held without evidence when we read in the *Times* such paragraphs as this :—

"LONGEVITY.—The report recently issued by the Registrar-General, relating to the year 1871, contained further testimony on the subject of long life. In 1871 the following deaths were registered in England, the ages (like other particulars) being taken on the statement of the relatives or other persons supplying information of the death. There were 27 persons registered as dying at the age of 100 years, 17 at 101, 10 at 102, 5 at 103, 3 at 104, 2 at 105, 2 at 106, 1 at 107, 1 at 108, 1 at 109 years. The last three should have special mention; a man in the district of Sevenoaks was registered as dying 107 years old; a man in the district of Ledbury 108; a woman in the district of Chester, 109 years old. Seven centenarians died in the Metropolis, and seven in Lancashire. Of the whole 69, 25 were men and 44 were women. From 1861 to 1871 the deaths of people registered as being 100 years old or more averaged 78 a year; 21 men and 57 women. The Registrar-General mentions, as the only known instance of an insured life reaching 100 years, that of Jacob William Luning, who died in 1870 at the age of 103 years. His age was clearly established by documentary evidence submitted to the Registrar-General, and published by him in his weekly return."

Another popular error very prevalent, is that cold, and even frost, is congenial to life and health. There is a proverb: "A green yule (*i.e.* Christmas) makes a fat churchyard." The registration of deaths directly contradicts this opinion. Cold, frosty weather destroys many lives, which might have lasted for years were the weather continuously mild.

## Note D.

### Waste of Human Life.

In one of his Annual Reports, the Registrar-General says, —"England is a great country, and has done great deeds. It has encountered in succession, and, at times in combination, all the Great Powers of Europe; has founded vast colonies in America; and has conquered an empire in Asia. Yet greater victories have to be achieved at home. Within the shores of these islands the twenty-eight millions of people dwell who have not only supplied her armies, and set her fleets in motion, but have manufactured innumerable products, and are employed in the investigation of scientific truths, and the creation of works of inestimable value to the human race. These people do not live out half their days. A *hundred and forty thousand* of them die every year unnatural deaths; *two hundred and eighty thousand* are constantly suffering from actual diseases which may be prevented. Their strength is impaired in a thousand ways, their affections and intellects are disturbed, deranged, and dimmed. Who will deliver the nation from these terrible enemies? Who will confer on the inhabitants of the United Kingdom the blessings of health and long life?" In a subsequent paper the Registrar-General tells us there are "two thousand medical men in the metropolis alone engaged in

treating existing diseases, whilst very few, if any, bestow any attention on measures of prevention, the reason being that they are paid in the one case, but would find no remuneration in the other." Perfectly true: even the rich neglect the first attacks of disease from reluctance to pay the Physician's fee. The services of the general practitioner are paid for in the shape of a bill for medicines—can anything be more impolitic?

A sensible course would be to pay the Physician an annual stipend for visiting the household periodically—to advise measures of prevention, and afford immediate aid on the first appearance of disturbed health, whether of the family or domestics. More attention would then be given to hygiene. It is not enough to appoint public officers of health; although this is highly proper and useful, it can never safely exclude individual efforts.

## Note E.

### MORAL AND RELIGIOUS ASPECTS OF LONGEVITY.

The influence of age on the mental faculties, the moral and religious aspects of longevity, do not come within my design. Writers of all ages, heathen and Christian, have treated on the subject: Cicero, Seneca, Cornaro, Sir Thomas Brown Sir Thomas Bernard, Sir Henry Holland, Lord Brougham, Mr. James Grant, and many others.

The following is profoundly interesting and suggestive:—

"It is related of the late Lord Lyndhurst, so long Lord Chancellor of England, who reached the age of ninety-two, in the full possession of his faculties, that in his declining years it was with him a perpetual theme of gratitude to God that his life had been so extended as to enable him to make

preparation for death, in which he was earnest and incessant. He applied, says a friend, all the power of his marvellous intellect and all his apprehensive quickness to the study of religion. And through its influences, his natural kindliness and loving disposition were refined into the highest Christian graces—true humility, hearty repentance, serene and earnest hope. He died in peace and charity with all mankind. His last words expressing supreme happiness."

I cannot refrain from making one remark—the result of long observation—for the benefit of those who have attained to an advanced age and are blessed with wealth. It is, that money, be it much or little, given to relatives as their needs occur, to charitable institutions or religious uses during the life of the donor, is far more beneficial, morally and materially, both to the recipient and the giver, than double, or rather many times, the amount devised by will.

## Note F.

### THE BONES OF OLD PEOPLE BRITTLE.

So little has the condition of the system in elderly people been investigated scientifically, that it is almost universally believed that the brittleness of the bones in age arises from a redundancy of earthy matter. This will be found stated in many books as if it had ever been ascertained. The simple truth is, it is a false inference from the fact that earthy concretions are often met with around the joints, in the blood-vessels about the heart, and other parts, which are then said to be ossified.

On the sure ground of chemical analysis, we know that the bones of aged persons have less earthy matter in them than in earlier life.

The following is the average of several analyses :—

| | Earthy Material. |
|---|---|
| Neck of thigh-bone of aged persons . . . | 31·3 |
| „ „ middle-aged persons | 50·1 |
| Shaft of thigh-bone of aged persons . . . | 53·3 |
| „ „ middle-aged persons | 56·7 |

## Note G.

### ANTICIPATIONS.

The remedies we already possess for many diseases have a history calculated to inspire hope that at some not very distant period, means will be found to arrest with certainty the ravages of time upon the human constitution, and to carry on life full of vigour to its utmost limits. Concerted efforts, such as have built up the noble science of Chemistry, have never been instituted for the discovery of remedies. Mere chance or individual zeal has hitherto been their source, and a comparatively short time has produced the present science of healing. A few examples will illustrate these remarks.

Peruvian bark was introduced into Europe about 300 years ago, a cure for intermittent fever. Little more than 50 years have elapsed since the crystalline constituents of this bark were first separated. Quinine, etc., are now employed in every country in the world, and save innumerable lives.

Vaccination has been known and practised scarcely 100 years. Many persons now living have heard from their fathers of the deadly ravages of small-pox in their days.

These two are the only remedies, excepting general sanitary measures, which have received the attention of government. The law enforcing vaccination, the cultivation of the tree producing quinine, are very recent recognitions of

the importance of the subject to the well-being of communities.

It would well become an enlightened government to take cognisance of another fact recently ascertained. In some localities, in India, in Africa, and in other countries, quinine is by no means infallible; but when it fails, another crystalline product derived from a common tree growing abundantly at our doors is successful. Commerce often precedes science as well as national policy, and enormous quantities of salicine are made and sold, not merely as a cheap substitute for quinine, but inasmuch as it is in those localities found to be more efficient. Were this recognised, how much money and how many valuable lives would it save to the country? It is doubtful whether it is known by the medical men now with our army on the Gold Coast.

Fever, that mysterious disease, so destructive to life (*i.e.* continued fever), is treated with great skill and energy on what are called general principles, and many lives are thus saved. Yet when we consider that fevers are always the result of poisons, for there are several without doubt, we feel surprised that an antidote, a remedy which will counteract the poison and cut short the disease, is not only not known, but not sought for. The Prince of Wales, the Imperial Prince of Germany, and the eldest son of the Czar, have all recently passed through all the stages of fever, happily with life; yet, how striking a proof do these cases afford of our ignorance of an antidote for continued fever, corresponding to the known remedy for intermittent. Would that I could do more than offer a suggestion to those who have to deal with fever; but I would suggest,—

1. That antimony has had a reputation for possessing the desired power for ages. Some preparations or salts of this metal more than others. There is one, however, never

hitherto tried so far as I know, which, judging from analogy, ought to possess the febrifuge power of the antimony in a very high degree. I allude to stibethyl oxide Sb $(C_2 H_3)_3$ O, a basic substance forming salts with acids, among which remedies of great power may probably be discovered.

2. The American Eclectic Physicians, whose contributions to our list of remedies have been most valuable, confidently state that the plant *Gelseminum sempervirens* will arrest and cure fever at its earliest stage. I am aware of the odium attaching to what is termed a search for specifics; but I am willing to incur it, since I am sure it is by the study of the special properties of remedies on the body in disease rather than by general principles, the art of healing will henceforth be advanced.

Some years ago, a writer in the *Quarterly Review* said it would be a great boon to humanity, were a substitute for mercury and its salts discovered, having similar powers but entirely innocuous. This as I have shown we now possess in podophyllin.

That valuable agent for producing sleep, hydrate of chloral, only came into use in 1869. This property of chloral was discovered by Dr. Liebreicht, a German physician, who finding in the laboratory that when hydrate of chloral is subjected to the action of caustic potash, it is decomposed, and evolves chloroform, conceived the idea that if taken into the animal body it would be decomposed very slowly by the potash existing in the flesh juices, and the nascent chloroform would produce anæsthesia. This hypothesis proved to be unfounded, but his experiments led to the discovery of its soporific action.

A dentist in America, in 1844, discovered the anæsthetic power of ether when inhaled. Sir James Simpson, seeking for a more convenient substance for rendering the body

insensible to pain under operations, found one in chloroform.

Nitrous oxide, or laughing-gas, was experimented upon by Davy in the laboratory of Dr. Beddoes at Bristol, and in the year 1800, he wrote, "As nitrous oxide in its extensive operation appears capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place." It was only in 1868, that it was brought into practical use as an anæsthetic, in extracting teeth.

The same Dr. Beddoes saw accidentally the cure of consumption in a family by arsenic. This hint seems to have been entirely disregarded by the profession, probably from the conventional aversion to specifics, although it was noticed by Dr. Thomas Young, in a historical work on consumption. It did not meet my eye until some time after I had employed arsenic in consumptive cases with marked success. I was led to it by a view I took of the disease founded upon a chemical examination of tubercle. My observations were published in a small work in 1856, by Churchill & Sons. Even yet this remedy is almost, if not entirely, disregarded by the profession in this country, although several eminent French physicians have adopted it, and testified to its efficacy. I have the pleasure of seeing many persons still living and in the enjoyment of health, who many years ago were pronounced to be consumptive and their lives despaired of.

Professor Lister's valuable discovery of the use of carbolic acid for healing wounds and preventing the fatal spread of purulent matter into the system (pyæmia) must not be forgotten in this connection.

While these pages were passing through the press, some extraordinary properties of an Australian tree were announced

in the *Times* and other papers, and seem to have attracted much attention. This tree, the *Eucalyptus globulus*, is said to have the power of destroying malaria in its vicinity, and thus rendering localities where it abounds healthy, which otherwise would be highly destructive of human life.

Experiments have been made on a large scale by planting this tree by thousands in Africa, at the Cape and in Algeria, in places previously most fatal by reason of fevers, and scarcely habitable, and the result has been highly satisfactory. The tree is of very rapid growth, absorbs water in great proportion, and thus dries up marshy places, rendering them susceptible of cultivation, and the whole neighbourhood healthy.

These remarks are intended to justify the anticipation I venture to express at the head of this note. In the vegetable kingdom, in the products of the chemical laboratory, we have not thousands but millions of substances unstudied and untried. Will any one venture to say what may or may not be discovered to affect human life?

It is curious to observe the variety both as to their source and nature, of the remedies we already know.

From the depths of the forest in South America, from the roadside in North America, from Australia, a country only known to Europe about 100 years, from the mineral kingdom, from the new bodies formed by bringing together elements never found united in nature,—from all these sources do we derive the means we daily use for relieving suffering and restoring life.

What will the knowledge and power of the next and succeeding generations be?

## Note H.

### Adulteration of Food, its Effects on Human Life. Wine.

If it be admitted (and there can scarcely be a doubt on the matter) that adulteration of our food and drink is injurious to the constitution, then we must expect it to tell with most force on persons who have passed middle life. When the daily injury is too slight for observation, its repetition for years, the cumulative effects of even weak poisons may become very serious. We find many diseases the origin or cause of which is obscure ; we deem them to have arisen spontaneously, but if we could ascertain with accuracy what substances had been introduced with the food habitually we might be able to assign them to some slow poison.

In or about the year 1820 a Mr. Accum, a chemist, wrote a book on the prevalence of adulteration in food, drinks, and medicines. Its title-page bore the significant motto from Scripture—"There is death in the pot." This publication excited great attention. Its facts could not be denied, but it was made the occasion of much amusement, and the reviewers expended their wit upon the subject. Yet it was was no laughing matter. Fifty years passed before the legislature dealt with the question, but at last, through the steady perseverance of Mr. Scholefield, the Act against adulteration was passed. Under this Act Inspectors are appointed and Magistrates punish its infringements. The Inspectors are doubtless able and vigilant, but this should by no means supersede the personal care of every person having regard to his own health or that of his family. Commercial men have elastic consciences, and even now they defend many sophistications which they allege are harmless. Selling chicory for coffee, potato starch for arrowroot, compounding mustard

with flour, turmeric, and pepper. These and the like practices are strenuously defended as being harmless. But when pickles are coloured with verdigris, and cayenne with red lead, etc., they will admit the wrong.

Adulterations and substitutions of cheaper for expensive articles extend to drugs and chemicals,—all we eat, drink, or swallow for any purpose.

The foreign producer pursues the same course, with even more dangerous consequences. Tea, sugar, wines, spirits, all demand vigilance.

Some years ago a patent was taken for a method of refining sugar. When cane juice is to be evaporated, or when the colour and impurities are to be removed, the presence of an acid interferes with the process, and requires to be neutralized. This is usually done by means of lime. The patent in question was for the employment of a basic salt of lead, and this was found to cause the product, the refined sugar, to be so greatly increased in quantity that the patent was valued at £80,000. The sugar thus made was subjected to examination by the most eminent chemists of the time, including I believe Faraday, Brande, and Daniel, and they certified that it contained no trace of lead. In fact analytical chemistry at that time was at a very low ebb, the attention of these eminent professors having been directed to physics, in which brilliant discoveries were of frequent occurrence. The Government, or rather I believe I may say Lord Palmerston, was not satisfied. Dr. Ure was consulted, and with his usual acumen he apprehended that the lead might exist in organic combination with the elements of the sugar, and consequently not manifest itself to ordinary tests. Acting upon this, it was discovered that the sugar contained a considerable portion of lead. We owe it to the firmness of Lord Palmerston, who went a little beyond the law, forbidding the use of lead

in this country and our colonies, and using his influence with foreign governments to prevent it wherever sugar is grown or refined, that we escaped this active cause of disease. Let me commend to the attention of the Inspectors sugars, especially the whiter sorts, it being very possible that lead may still be furtively employed in the manufacture in foreign countries.

Need I add how dreadful are the effects of lead when accumulated in the living body? No disease is more distressing than paralysis—its usual result.

While adulteration of solid articles of food is easily detected, wines and spirits present some difficulty.

In "Familiar Letters on Chemistry," which I edited for Liebig, it is related that the bulk of German (and probably French) wines are made thus:—After the grape juice is fermented and the resulting wine drawn off from the residue, *i.e.* the "must"—starch, sugar, cream of tartar, and an amount of water equal to the wine drawn off, are added and subjected to fermentation. This delightful stuff is so far wine as it is flavoured by the "must" or dregs left after making the real wine.

Again: In the *Times* of Dec. 10th, 1873, there is a leading article giving an account of the sherry drank so largely in this country. As my purpose is a serious one—the causes of premature loss of life—I make no apology for this long note.

"The correspondence which we have lately published, on the manufacture of the liquid sold in this country under the name of 'sherry,' seems calculated to shake even the robust faith of the British householder in the merits of his favourite beverage. The correspondence had its origin in the fate of an unfortunate gentleman who was found, by the verdict of a coroner's jury, to have died from an overdose of alcohol,

taken in four gills of sherry; and, as it proceeded, it gradually unfolded some of the mysteries of the processes by which the product called sherry is obtained. In the first place, it seems that the grapes, before being trodden and pressed, are dusted over with a large quantity of plaster of Paris (sulphate of lime), an addition which removes the tartaric and malic acids from the juice, and leaves sulphuric acid in their stead, so that the 'must' contains none of the bitartrate of potash, which is the natural salt of wine, but sulphate of potash instead, usually in the proportion of about two ounces to a gallon. Besides this, the common varieties of 'must' receive an additional pound of sulphuric acid to each butt, by being impregnated with the fumes of five ounces of burning sulphur. When fermentation is complete, the wine may contain from a minimum of about 14, to a *maximum* of 27·5, per cent. of proof spirit; but it is not yet in a state to satisfy the demands of the English market, neither can it be trusted to travel without undergoing secondary fermentation or other changes. It is therefore treated with a variety of ingredients to impart colour, sweetness, and flavour; and it receives an addition of sufficient brandy to raise the alcoholic strength of the mixture to 35 per cent. as a *minimum*, or in some cases to as much as 59 per cent. of proof spirit. When all this has been done, it is shipped in the wood for England, where it is either bottled as 'pure' wine, or is subjected to such further sophistications as the ingenuity of dealers may suggest."

The article goes on to observe that the vendors of this precious stuff escape the Adulteration Act by calling it, not "wine," but "sherry," and explaining how and with what materials it is compounded; adding,—

"The general result is, that what many people purchase and use as wine is simply a rather strong grog, with an

admixture of flavouring matters, and containing a very appreciable quantity of sulphuric acid—a substance which is known in commerce as oil of vitriol, and which, when used in medicine, is administered in small and carefully-considered doses."

"What we have described as 'sherry' is, it must be remembered, the best of the many compounds bearing that name which are offered to the public. Besides this, there are thousands of butts manufactured yearly at Cette, at Hamburg, and at various places on the Elbe, which contain no Spanish wine at all, probably no wine of any kind, and which consist only of alcohol, water, and chemical flavouring. These 'sherries' are stronger than any which come from Spain; and they are largely used in this country, not only in 'refreshment bars' and public-houses, but also as a cheap form of diluent for alcohol, by the manufacturers of whiskey and brandy. The liquids sold under these names, even when they have been sent to France and re-imported as Cognac, consist in great measure of Hamburgh 'sherry' fortified by the addition of more alcohol."

Surely, it would not exceed the duty of a government which has done so much to protect the population from disease by enforcing sanitary regulations—drainage, house-cleaning, etc., to interfere vigorously and repress this abominable traffic.

It is quite clear that those persons who desire to enjoy a long life, and escape the disorders of age, must carefully eschew such drinks. As, however, I must admit, that some form of stimulant is not merely desirable, but essential, to the life and comfort of many elderly persons, it becomes an important question, how a wholesome substitute for wines and the spirituous liquors met with in commerce can be obtained.

## Note I.

### Appliances useful to aged persons for prompt relief of suffering.

The following ought to be kept at hand by all persons of advanced age:—

1. An Etna, with a bottle of pure spirits of wine, for obtaining boiling water in a few minutes.

2. Tin vessels for applying hot water, (1) to the feet, (2) to the chest or abdomen. This should be the common rounded stomach warmer.

N.B.—India-rubber bottles are not so useful, and in other respects they are objectionable.

3. Two or three Enema Apparatus, of different kinds and modes of action.

4. An Inhaler. The one known as the Eclectic is the best. Many kinds are sold; some useless, or worse.

5. An apparatus for administering a Hot Vapour or Air Bath to the patient when in bed.

6. An open Slipper Bath. This may be used for the hot water when applied with soap and flannel.

All medicines can readily be obtained in towns from the dispensing druggists; but in the country should be kept Castor-oil, Magnesia, Epsom Salts, Laudanum, Mustard, Linseed Meal, pure washed Ether, and such other drugs and chemicals as experience has taught may be useful to any individual.

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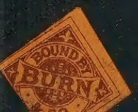
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